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STATICS AND DYNAMICS: KALEIDOSCOPIC WORDS

FRITZ MACHLUP

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This essay is one in a series of studies in economic semantics: inquiries into the meanings of some of the most widely used terms in economics. Serious terminological ambiguities and conceptual obscurities have been found to exist, some of them curable, others beyond hope of clarification. Previous essays have dealt with the "marginal product,"[1] with "forced saving,"[2] with the "balance of payments,"[3] with "equilibrium and disequilibrium,"[4] with "structure and structural change";[5] the present essay will deal with "statics and dynamics" and the truly kaleidoscopic variety of meanings that have been given to these learned terms.

Statics is derived from the Greek στατικός, which means "causing to stand," and Dynamics from δυναμικός, which means "causing to move." Thus, an extremist may say, since all economics is designed to explain *change*, there can be no such thing as "Economic Statics"—and all economics must needs be dynamic. On the other extreme, since all economics must use a method of isolating some factors from others, which involves assuming some variables to be *unchanged*, there can be no such thing as "Economic Dynamics"—and all economics must needs be static. The fact is that economists in their reasoning must always cause some variables to "stand" and some variables to "move"—which leaves us nowhere in deciding this argument.

I. STATEMENTS ON THE DISTINCTION BETWEEN STATICS AND DYNAMICS

Not all writers who have used the terms have bothered with defining them. But often, even where there are no definitions, some statements can be found in which a writer reveals what he means. I have examined a representative sample of the literature for statements defining or distinguishing Statics and Dynamics, and shall present a collection of them. But first I should explain some conspicuous omissions in the collection.

1. Some of the great system builders whose works have been widely discussed as significant contributions to Economic Dynamics have not themselves used this term. For this reason, Ricardo, Malthus, Sismondi, List, Marx, the writers of the German Historical School, and finally Robertson are not represented on the list. But we shall return to them—and also to Keynes—in Section II in order to find what in the eyes of their critics or admirers characterizes their methods as Statics or Dynamics.

2. Some of the great names in the history of economic thought are absent from the list because these authors said nothing at all or nothing worth quoting on the distinction between Statics and Dynamics; this is true, for example, for Jevons, Menger, Böhm-Bawerk, Wieser, Cassel. Jevons made one, quite casual, remark in the preface of his *Theory*, which was interpreted in contradictory ways.[6] Menger said nothing about

[1] Fritz Machlup, "On the Meaning of the Marginal Product," *Explorations in Economics* in Honor of F. W. Taussig (New York: McGraw Hill, 1937), pp. 250–63. Reprinted in *Readings in the Theory of Income Distribution* (Philadelphia: Blakiston, 1946), pp. 158–174.

[2] Fritz Machlup, "Forced or Induced Saving: An Exploration into its Synonyms and Homonyms," *Review of Economic Statistics*, Vol. XXV (1943), pp. 26–39.

[3] Fritz Machlup, "Three Concepts of the Balance of Payments and the So-called Dollar Shortage," *Economic Journal*, Vol. LX (1950), pp. 46–68.

[4] Fritz Machlup, "Equilibrium and Disequilibrium: Misplaced Concreteness and Disguised Politics," *Economic Journal*, Vol. LXVIII (1958), pp. 1–24.

[5] Fritz Machlup, "Structure and Structural Change: Weaselwords and Jargon," *Zeitschrift für Nationalökonomie*, Vol. XVIII (1958), pp. 280–298.

[6] Jevons referred to "a close analogy" of the theory of wealth and value "to the science of Statical Mechanics" because the former is "explained by

Statics and Dynamics, which is noteworthy in the case of an author of two books on the methodology of economics. Böhm-Bawerk used the terms only in review articles when he referred to the uses J. B. Clark and Schumpeter had made of them, but he did not propose alternative definitions or suggest alternative meanings.[7] In Wieser's work only a short and misleading statement about Statics, and nothing about Dynamics, can be detected.[8] Cassel used "static" as a synonym for "stationary," and contrasted his model of a stationary economy with one of the "steadily progressing economy," without using the term "dynamic."[9] Perhaps Mitchell should be mentioned in this company; although sometimes named among the pioneers of "quantitative dynamics," he can be quoted only as the author of somewhat emotional pronouncements on the two concepts.[10]

3. Several well known names in contemporary economics are not included, simply because the list is designed to be merely a "sample." There would have been no point in multiplying restatements of points of view already clearly stated by others. Needless to say, some more original definitions or characterizations may have been overlooked. Their authors are requested to pardon the oversight, and to take comfort in the thought that this essay is, in a sense, a pillory of terminological originality. Writers are implicitly castigated for their originality in the meanings given to accepted terms!

The statements included in the list are, whenever possible within the brief space, quoted literally, though some of the statements are synthetic in the sense that they have been put together from different pages or different chapters of a book, or even from different books of an author. In a few instances, for the sake of brevity, a concise paraphrase was substituted for a long statement; the absence of quotation marks indicates where the authors' own language was replaced by the compiler's paraphrase.

The order of the entries is roughly chronological; only very roughly though, because the statements quoted have often been made in similar form in earlier works by the same author, or because several statements are put together from passages of different publications that have appeared many years apart. Thus, if a statement is quoted from a book first published in 1955, it is quite possible that virtually the same ideas were expressed in a book the same author had published in 1939. As a result, the order of the

the consideration of indefinitely small amounts of pleasure and pain, just as the Theory of Statics is made to rest upon the equality of indefinitely small amounts of energy." He added that the "dynamical branches of the Science of Economy may remain to be developed"—but he failed to say just what they should deal with. W. Stanley Jevons, *The Theory of Political Economy* (London: Macmillan, 1871), pp. viii–ix. Streller had no doubts that Jevons meant Dynamics to be "Practical Economics" while Statics was "Theoretical Economics." Rudolf Streller, *Statik und Dynamik in der theoretischen Nationalökonomie* (Leipzig: Streller, 1926), pp. 45–46. Kuznets, on the other hand, inferred from "the analogy ... with static and dynamic mechanics" that "statics would deal with the relation of forces at the equilibrium level, dynamics with the same relations in the changes that lead toward equilibrium." Simon Kuznets, "Static and Dynamic Economics," *American Economic Review*, Vol. XX (1930), p. 426; reprinted in *Essays in Economic Change* (New York: Norton, 1953), p. 32.

[7] Böhm-Bawerk did not reject the terms; he spoke of "this certainly important and fruitful distinction, which in the most recent theoretical literature, chiefly thanks to Clark's influence, has received great honors." Eugen von Böhm-Bawerk, "Eine 'dynamische' Theorie des Kapitalzinses," *Zeitschrift für Volkswirtschaft, Sozialpolitik und Verwaltung*, Vol. XXII (1913), p. 3. It is not understandable why Schumpeter—whose theory was criticized in that article—should later remark that "Many, among them Böhm-Bawerk, would not hear of statics and dynamics at all." Joseph A. Schumpeter, *History of Economic Analysis* (New York: Oxford University Press, 1954), pp. 966–67.

[8] Wieser, in this statement, rejected all Statics—which he confused with a mathematical system, "like mathematical physics," that disregarded some of the essentials of human action and economic choice. Friedrich von Wieser, *Theorie der gesellschaftlichen Wirtschaft. Grundriss der Sozialökonomik*, 1. Abteilung, 2. Teil (Tübingen: Mohr-Siebeck, 2nd ed., 1924), p. 40.

[9] Gustav Cassel, *The Theory of Social Economy* (New York: Harcourt Brace, 1924), pp. 29, 34.

[10] Mitchell wrote that static theory was providing an "escape from stern reality into a romantic world," whereas Dynamics furnished "scientific" theories of "the cumulative change of institutions." Wesley Clair Mitchell, "The Prospects of Economics," in Rexford Guy Tugwell, ed., *The Trend of Economics* (New York: Alfred A. Knopf, 1924), p. 27.

entries should not be taken to reflect "priority." (Let me repeat that priority in the use of a novel meaning of a term is no cause for pride; in fact it betrays a lack of "terminological discipline" and a want of linguistic inventiveness—for when a writer creates or modifies a concept he ought also to coin a new word to denote it, rather than corrupt the language and spread confusion.)

A Collection of Statements on the Distinction between Statics and Dynamics in Economics

Author	*Statistics*	*Dynamics*
A. Comte[11]	Abstract theory of social order	Theory of social progress
J. S. Mill[12]	Study of "the economical laws of a stationary and unchanging society," especially "of the economical phenomena considered as existing simultaneously" and of "the principles of their interdependence"	Study of "the tendencies" of "the economical conditions undergoing progressive changes"; "thereby adding a theory of motion to our theory of equilibrium"
L. Walras[13]	Analysis of interdependence in which we "imagine an economy establishing . . . equilibrium *ab ovo* over a given period of time during which no changes take place in the data of the problem"	Analysis of interdependence in which we "suppose the data of the problem . . . to vary as a function of time," with "the fixed equilibrium . . . transformed into a variable or moving equilibrium," "constantly being disturbed by changes in the data and . . . constantly being reestablished"
J. N. Keynes[14]	Study of "phenomena . . . as they present themselves under given conditions"	Study of "manner in which (economic and social) conditions change over . . . time," especially "study of economic progress," chiefly by "historical method"
A. Marshall[15]	Study "of some group of tendencies . . . isolated by the assumption other things being equal": "we fix our minds on some central point" and "treat variables provisionally as constants"	Study of economic "change and progress," taking account of "complex mutual interactions" and gradually approximating the world in which "all these mutual influences take time to work themselves out, and, as a rule, no two influences move at equal pace"
J. B. Clark[16]	Methodological device of "isolating" by holding conditions constant, yielding "real laws . . . working" both in a "stationary state" and in a society in "movement and disturbance"	"Laws" accounting for "variations of actual incomes from . . . natural standards" and "for the slow and steady change" in these standards, especially under the influence of "five generic changes" in conditions—population, capital, technology, business organization, and tastes.
T. Veblen[17]	(a) "Taxonomic" Statics—where	"Evolutionary Economics"—"a close-knit

[11] Auguste Comte, *Cours de philosophie positive* (Paris, 1839–42).

[12] John Stuart Mill, *Principles of Political Economy* (London, 1848), Book IV, ch. 1.

[13] Leon Walras, *Elements of Pure Economics*, Translated by William Jaffé (Homewood, Ill.: Irwin, 1954), pp. 318, 319. [Published in French in 1873.]

[14] John Neville Keynes, *Scope and Method of Political Economy* (London: Macmillan, 1890, 2nd ed., 1897), pp. 144, 145.

[15] Alfred Marshall, *Principles of Economics* (London: Macmillan, 8th ed., 1920). pp. xv, 366, 368, 369, 380, [First edition 1890.]

[16] John Bates Clark, *The Distribution of Wealth* (New York: Macmillan, 1899), pp. 30, 36, 56, 60.

[17] Thorstein Veblen, *The Place of Science in Modern Civilisation and Other Essays* (New York: Viking Press, 1932), pp. 70, 72, 77, 165, 190, 232, 242, 243. [First published in 1898, 1900, 1908, and 1909.]

Author	*Statistics*	*Dynamics*
	"the activity ("not to disturb the equilibrium . . . between variables") goes on in perfection, without lag, leak, or friction" (b) Clarkian "Dynamics"—a conception "of an imperfectly static state," involving "changes in the absolute or relative magnitude of the several factors comprised in the equation," but still an "equilibrium between variables"	body of theory . . . of an unfolding sequence," giving "a genetic account of the life process" and of "the growth and mutations of the institutional fabric"; a "theory of genesis, growth, sequence, change, process, or the like, in economic life," "of a process of cultural growth as determined by the economic interest, a theory of a cumulative sequence of economic institutions stated in terms of the process itself"—not of the "determination . . . of the outcome of the process"—where "each new situation is a variation of what has gone before it and embodies as causal factors all that has been effected by what went before"
K. Wicksell[18]	(a) "Aspect of the problem of equilibrium" which concerns itself with "the conditions necessary for the maintenance, or the periodic renewal, of a stationary state of economic relations" (b) Analysis based on the assumption of "a society which retains unchanged from year to year the same population, the same area of territory and the same amount of capital, and remains on the same level of technical achievement"	(a) "Complete analysis of economic phenomena" taking account of changes in "the total supply of labor," capital, and land, and "in the efficiency of the available supply of labor," etc. (b) "Can only be successfully presented in combination with the practical part of our subject" (c) "Transition to dynamic point of view": treatment of "the problem of saving or accumulation of capital—which is equivalent to production without corresponding consumption—as well as its negative counterpart, capital consumption" (d) (Imputed by Myrdal) Theory of the "cumulative process" by which a deviation from monetary equilibrium evolves and progresses
V. Pareto[19]	First part of "pure economics," studying "equilibrium" under the assumption of given and unchanged conditions	(a) Second part of "pure economics," studying "successive equilibria" under changing conditions; (b) Third part of "pure economics," studying "the movements of economic phenomena"
M. Pantaleoni[20]	"Study of equilibrium positions"	"Study of movements taking place in positions of disequilibrium and leading to a return to equilibrium positions"
F. Y. Edgeworth[21]	Study of "properties" of "positions of equilibrium" of the economic system	Study of "the path of the economic system from any . . . random [position] to a position of equilibrium"

[18] Knut Wicksell, *Lectures on Political Economy* (London: Routledge and Kegan Paul, 1934), pp. 7, 105. [Published in Swedish in 1901.]

[19] Vilfredo Pareto, *Manuel d'Economie Politique* (Paris: Girard, 2nd ed. 1927), p. 147. [First Italian edition 1906.]

[20] Maffeo Pantaleoni, "Some Phenomena of Economic Dynamics," *International Economic Papers*, Vol. V (London: Macmillan, 1956), p. 28. [Italian version in *Giornale degli Economisti*, 1909.]

[21] Francis Y. Edgeworth, *Papers Relating to Political Economy* (London: Macmillan, 1925), Vol. II, p. 311. [Written in 1889.]

Author	*Statistics*	*Dynamics*
J. A. Schumpeter[22] (early writings)	Theory or "logic of the economy's circular flow," explaining "changes in the equilibrium position of the economy as originating in changes of the data," that is, as adjustments to "exogenous disturbances"	Theory of "economic development . . . changing the data of the static system" through "innovations" by "dynamic entrepreneurs"
F. Oppenheimer[23]	"A part of dynamics," studying, "not a state of rest, but a state of movement . . . that is not exposed to disturbances through changes in the data during the interval of observation"; includes "comparative statics"	The entire "social process," the subjec matter of sociology, "containing Statics and Kinetics as its two parts"; "Kinetics . . . comprises all studies of movements which change in magnitude or direction or both" because of "changes in data"
F. H. Knight[24]	"Reasoning" about "economic change" in the only possible method: varying one thing while holding others constant	Cannot exist as "economic science"—though perhaps as "evolutionary or historical economics"
N. D. Kondratieff[25]	"Conception [which] considers economic phenomena, essentially and as a matter of principle, without taking into account their variations in time. It deals with reality as if its elements were in a state of fixed equilibrium"	"Conception [which] considers economic phenomena in the process of changes in their elements and in the interrelations of the latter in the course of time, and seeks to discover regularities in the progress of these variations," with special attention to "quantitative variations" and to "reversible and non-reversible processes"
R. Streller[26]	"A conception which abstracts from all time intervals that may arise between individual economic acts"; "derived from dynamics by way of abstractions made on methodological grounds"	"A conception of which time intervals are an integral part"; "coextensive with the subject matter of economic theory"
J. M. Clark[27]	Theory of "equilibrium," based upon "the relative stability of economic values" and upon the assumption of an "unchanging pattern of action"	Study "which focuses attention on processes of change," "restores realism by putting in everything that statics leaves out": (a) dealing with "quantitative departures from static norms,"

[22] Joseph A. Schumpeter, *Theorie der wirtschaftlichen Entwicklung* (Leipzig: Duncker & Humblot, 1912), pp. 96, 464, 489, 522.

[23] Franz Oppenheimer, *System der Soziologie*, 1. Halbband des I. Bandes. 2. Halbband des III. Bandes. (Jena: Fischer, 1922), pp. 68, 71, 74, 76; *Theorie der reinen oder politischen Ökonomie: Die Gesellschaftswissenschaft*, (Jena: Fischer, 1924), p. 618.

[24] Frank Hyneman Knight, *Risk, Uncertainty and Profit* (Boston: Houghton, Mifflin, 1921), pp. 16–17; "Statik und Dynamik," *Zeitschrift für Nationalökonomie*, Vol. II (1930), English translation in *Ethics of Competition and Other Essays* (New York: Harper, 1935), pp. 167, 169.

[25] N. D. Kondratieff, "The Static and the Dynamic View of Economics," *Quarterly Journal of Economics*, Vol. XXXIX (1925), pp. 576, 577, 579, 580.

[26] Rudolf Streller, *Statik und Dynamik in der theoretischen Nationalökonomie* (Leipzig: Streller, 1926), p. 135.

[27] John Maurice Clark, "The Relation between Statics and Dynamics," *Economic Essays in Honor of John Bates Clark*, Jacob Hollander, ed. (New York: Macmillan, 1927), p. 46. Reprinted in *Preface to Social Economics* (New York: Farrar & Rinehart, 1936), pp. 196, 203; "Statics and Dynamics," *Encyclopedia of the Social Sciences*, Vol. 14, (New York: Macmillan, 1934), p. 354.

Author	*Statistics*	*Dynamics*
		(b) "second level of dynamics"—"perhaps to be called evolutionary"—dealing with "qualitative evolution of the basic legal institutions . . . , of forms of business organization and of competition, or dynamic changes or long run evolution in human nature itself"
H. L. Moore[28]	Theory of "static equilibrium" showing "the interdependence of all economic quantities" and through "simultaneous mathematical equations the conditions of their common determination"	Theory of "moving equilibria, oscillations, and secular change" which "presents all of the interrelated economic quantities in a synthesis of simultaneous . . . equations" "where all the variables in the constituent problems are treated as functions of time"
S. Kuznets[29]	Study of economic "relations and processes on the assumption of a uniformity and persistence of either the absolute or relative economic quantities involved," based on "a single principle of individual activity"	"Study of changes in the social phenomena over historical time"—"without descending to the level of individual activity"—with "emphasis on statistical research"
E. Lindahl[30]	Study of "economic developments taking place in time," though "the variables studied do not change their values with the lapse of time"; thus, "a special application of general dynamic theory for stationary conditions"	(a) "General dynamic theory"—"to determine certain variables as functions of time . . . with the help of equations based on . . . initial values of these variables and the conditions which determine their fluctuations," with emphasis on plan making and plan changing; (b) "Special dynamic theory"—an "application of general dynamic theory to . . . changing and evolutionary" conditions
R. Frisch[31]	Theory of economic interdependence in which "all the variables belong to the same point of time"	Theory "that explains how one situation grows out of the foregoing," by considering "the magnitudes of certain variables in different points of time," and introducing "certain equations which embrace at the same time several of these magnitudes belonging to different instances"; (a) "micro-dynamics," (b) "macro-dynamics"
G. Myrdal[32]	Study of "the changes of certain interdependent factors," such as "relative prices," by an "instantaneous analysis," as-	Study of "the changes of certain interdependent factors" and "the time sequences" by a "period analysis" of "the development from one point of time to a

[28] Henry Ludwell Moore, *Synthetic Economics* (New York: Macmillan, 1929), pp. 2, 4, 6.

[29] Simon Kuznets, "Static and Dynamic Economics," *American Economic Review*, Vol. XX (1930), reprinted in *Essays in Economic Change* (New York: Norton, 1953), pp. 32, 35, 38, 44.

[30] Erik Lindahl, *Studies in the Theory of Money and Capital* (New York: Farrar & Rinehart, 1939), pp. 31, 32. [Swedish version 1930.]

[31] Ragnar Frisch, "Propagation Problems and Impulse Problems in Dynamic Economics," *Economic Essays in Honor of Gustav Cassel* (London: Allen & Unwin, 1933), pp. 1–2.

[32] Gunnar Myrdal, *Monetary Equilibrium* (London: Hodge, 1939), pp. 35, 36, 43, 44. [German version in 1933.]

Author	*Statistics*	*Dynamics*
	suming "that a deviation from the equilibrium position brings about reactive forces which restore equilibrium again"	second and a third and so on," assuming that equilibrium may be "labile," that "the mutual adjustments . . . take time" and that "the time order in which they occur is decisive for the outcome"
E. Lundberg[23]	Study of "how certain variables . . . adapt themselves to given data until a state of equilibrium has been reached," whereby "the adaptation process itself does not influence the fundamental conditions of equilibrium" and "all variable factors . . . are simultaneously variable" and "simultaneously interdependent"	"Sequence analysis" "explaining how each state is derived from a preceding one and, in turn, induces the next," and thus explaining "how the conditions of equilibrium themselves are changed," taking account of different "reaction times" and "reaction patterns"
L. Mises[24]	"Method of all scientific work, designed to analyze the effect of the change of any one factor *ceteris paribus* . . . The assumption of perfect changelessness of all other conditions . . . is a fiction indispensable for science and for thinking in general." ". . . its aim is the explanation of change"	"Everything that can be said about the theory of action is theory of change, and in this sense would have a claim on being called Dynamics." Beyond this, the search for "dynamic theory . . . is devoid of any sense"
J. A. Schumpeter[25] (later writings)	Analysis "expressed in terms of the values which our variables assume at any single point of time," i.e., connecting "economic quantities that refer to the same point in time"	"Theorems" which "include in our functions values of variables which belong to different points of time"—this terminology adopted "in deference to Professor Frisch"—"practically coextensive with sequence analysis" and "includes period analysis," but "not coextensive with the theory of economic growth, or development, or progress"
J. R. Hicks[26]	Theory in which "we do not trouble about dating" the economic quantities involved	Theory in which "every quantity must be dated"
G. Haberler[27]	"Theory where all the variables relating to a certain . . . time are explained by data relating to the same point or period of time,"—hence without time lags "in the causal nexus"	Theory where "a magnitude is explained by another relating to an earlier . . . time,"—hence with "lags in the causal nexus"

[23] Erik Lundberg, *Studies in the Theory of Economic Expansion* (London: King, 1937), pp. 2, 3, 9, 11, 17, 243.

[24] Ludwig von Mises, *Grundprobleme der Nationalökonomie* (Jena: Fischer, 1933), pp. 104, 105. *Nationalökonomie: Theorie des Handelns und Wirtschaftens* (Geneva: Union, 1940), p. 244; *Human Action* (New Haven: Yale University Press, 1949), p. 353.

[25] Joseph A. Schumpeter, *Business Cycles* (New York: McGraw-Hill, 1939), p. 48; *History of Economic Analysis* (New York: Oxford University Press, 1954), pp. 1142, 1160.

[26] John R. Hicks, *Value and Capital* (London: Oxford University Press, 1939), p. 115.

[27] Gottfried Haberler, *Prosperity and Depression* (Geneva: League of Nations, Revised edition, 1939), pp. 249, 250.

Author	*Statistics*	*Dynamics*
R. F. Harrod[38]	Theory which, taking "certain fundamental conditions to be given and known," will "determine the values of certain unknowns," such as annual rates of inputs and outputs and prices of factors and products	Theory where "the fundamental conditions will themselves be changing, and the unknowns . . . to be solved will not be rates of output per annum, but increases or decreases in the rates of output per annum"
A. G. Hart[39]	"Timeless equilibrium theory"	Theory which concentrates "on the time element" and, especially, "allows for anticipations of change and for uncertainty"
F. A. Hayek[40]	(a) "Timeless" "equilibrium theory" (b) Theory of "stationary state"	(a) "Intertemporal equilibrium" theory, analyzing the "fictitious state" of "complete compatibility of *ex ante* plans" at "successive moments of time' (b) "Explanation of the economic process . . . in time," not through interdependences, but "as chain of historical sequences"
F. S. C. Northrop[41]	A deductive system based on "empirically verified postulates" but without verification of its "deduced consequences"	Impossible—would be "an empirically verified deductive system" enabling us "through its postulates and theorems . . . to deduce a future state" once the "quantitative values" "defining the present state" are empirically determined
J. Tinbergen[42]	"Theory . . . based on the assumption of a stationary position," confined to "exogenous movements," i.e., those "that may be considered as the immediate, or the almost immediate, adaptation to changes in data"	Theory "to explain . . . endogenous processes," "which will follow step by step the process of adaptation and the succeeding movements," with time "as one of the variables"
P. Samuelson[43]	"Simultaneous and instantaneous or timeless determination of economic variables by mutually interdependent relations"	Study of "functional relationships" among "economic variables at different points of time" or, that is, "between economic variables and their rates of change, their 'velocities,' 'accelerations,' or higher 'derivatives of derivatives' " (a) "discrete processes, treated in 'period analysis' " [with "difference equations"], (b) "continuous processes involving flows,

[38] Roy F. Harrod, "An Essay in Dynamic Theory," *Economic Journal*, Vol. XLIX (March 1939); *Towards a Dynamic Economics* (London: Macmillan, 1948), p. 4.

[39] Albert Gailord Hart, *Anticipations, Uncertainty, and Dynamic Planning*. Studies in Business Administration, Vol. XI, No. 1 (Chicago: University of Chicago Press, 1940), pp. vii, 1.

[40] Friedrich A. Hayek, *The Pure Theory of Capital* (London: Macmillan, 1941), pp. 17, 18, 22, 23.

[41] F. S. C. Northrop, "The Impossibility of a Theoretical Science of Economic Dynamics," *Quarterly Journal of Economics*, Vol. LVI (1941), pp. 1, 12.

[42] Jan Tinbergen and Jacques J. Polak, *The Dynamics of Business Cycles* (Chicago: University of Chicago Press, 1950), pp. 102, 103. [Dutch version 1942.]

[43] Paul A. Samuelson, "Dynamic Process Analysis," *Survey of Contemporary Economics*, Vol. I, Howard S. Ellis, ed. (Philadelphia: Blakiston, 1948), p. 354. See also *Foundations of Economic Analysis* (Cambridge: Harvard University Press, 1947), pp. 311–317.

Author	*Statistics*	*Dynamics*
		treated in 'rate analysis' " [with "differential equations"]
G. J. Stigler[44]	Theory "which explains the equilibrium position in the particular problem on the assumption that the data of that problem do not change"	Study "of the path by which a set of economic quantities . . . reach equilibrium within a static framework"
F. Machlup[45]	Theory of "economic change," explaining change as "adjustment to change," where "time is eliminated as a variable and time sequences do not affect the results of a process"	Theory of "step-by-step adjustments . . . as sequences in time," showing "these movements from period to period" and the effects of different "time sequences" depending on "in what order [certain] steps are taken" and on the "time intervals between the steps"
W. J. Baumol[46]	Analysis of "a time-slice, a cross section . . . , thereby eliminating the passage of time from the problem, though . . . not necessarily eliminating the influence of time altogether"	"Study of economic phenomena in relation to preceding or succeeding events," (a) "Magnificent dynamics"—"broad generalizations, often in the nature of alleged . . . laws," concerning secular changes and "the development of the whole economy over long periods"; (b) "Statics involving time"—"concerned with features of the system other than the process of change itself"; (c) "Process (or sequence) analysis"—"step-by-step analysis of economic changes" over relatively short "spans of time"
G. L. S. Shackle[47]	"Economics of perfect adjustment," an analysis in which "time has no significant place, and uncertainty no place"	(a) "Calculable dynamics"—introducing "dynamic time" "in the form of lagged reactions or of steady growth" (b) Expectational dynamics—introducing "expectational time and uncertainty," i.e., uncertain expectations of the future
F. Zeuthen[48]	"Approach" which "does not include anything about the connection between conditions at various points of time (about movements in time, increases, lags, uncertain expectations, etc.)"	"Approach" where "differences in time are taken into consideration . . . , for instance, . . . the velocities with which changes take place," or "growth, the process of adjustment, subsequent effects or time-consuming processes on the whole," also "uncertain or mistaken expectations"; divided into (a) "momentary dynamic analysis," analyzing "the conditions of a single moment where movement is going on"; (b) "the course of economic phenomena through a period of time" (sequence analysis); (c) "comparative dynamics" analyzing "alterna-

[44] George J. Stigler, *The Theory of Price* (New York: Macmillan, 1947), pp. 25, 26.

[45] Fritz Machlup, *International Trade and the National Income Multiplier* (Philadelphia: Blakiston, 1943), p. vii; *The Economics of Sellers' Competition* (Baltimore: Johns Hopkins, 1952), pp. 34, 187, 188, 189.

[46] William J. Baumol, *Economic Dynamics* (New York: Macmillan, 1951), pp. 2, 4, 6, 123.

[47] George L. S. Shackle, *Uncertainty in Economics and other Reflections* (Cambridge: University Press, 1955), p. 218.

[48] Frederik Zeuthen, *Economic Theory and Method* (Cambridge, Mass.: Harvard University Press, 1955), pp. 27, 78, 79, 139, 140.

Author	*Statistics*	*Dynamics*
		tive movements . . . under alternative conditions"
D. Patinkin[42]	(a) "Analysis of . . . the nature of the equilibrium position" (b) Comparative Statics: "comparison of equilibrium positions before and after a specified change in one or more of the independent variables"	"Analysis of . . . the nature of the market forces which bring the economy to equilibrium from an initial position of disequilibrium"

II. PUTATIVE STATICS AND DYNAMICS

For more than twenty years I have been telling my students that one of the widespread uses of "Statics" and "Dynamics" was to distinguish a writer's own work from that of his opponents against whom he tried to argue. Typically, "Statics" was what those benighted opponents have been writing; "Dynamics" was one's own, vastly superior theory.[43]

Besides this attribution of a "static" character to the writings of others, who might not have so regarded their work, we also find "dynamic" theorizing attributed to writers who had not themselves used this term, either because it had not yet been introduced into economic literature or because they avoided it. It may be instructive to ascertain just what features of their studies have earned for them the label "Dynamics," and whether these putative contributors to dynamics were conscious of their doing something that was "different" from whatever may be regarded as "non-dynamic."

What is now widely called "Classical Dynamics" are the theories—associated chiefly with Malthus, Ricardo, James Mill, McCulloch, Senior—

> ambitiously attempting to analyze the growth and development of entire economies over relatively long periods of time—decades or even centuries . . . The basic theme . . . was the development of the economy from a progressive state into a stationary state . . . with no net investment, subsistence wages, and low or even zero profits . . .[44]

Baumol calls this theory "Magnificent Dynamics" because of the "sweeping generalizations," "inspired oversimplifications," and the "daring and imaginative" thought on which these theories were based. The chief building stones of "Classical Dynamics" were (a) the Malthusian law of population, (b) the law of (historically) diminishing returns, (c) the propensity to accumulate (invest profits), and (d) the law of wages (which are raised through increased investment demand and depressed through increased labor supply).[45]

Because of the eventual disappearance of profits and the resulting end of accumulation and growth which these theories predict, historians of thought referred to their authors as "The Pessimists."[46] If they are now regarded as builders

[42] Don Patinkin, *Money, Interest, and Prices: An Integration of Monetary and Value Theory* Evanston, Ill.: Row, Peterson, 1956, p. 32.

[43] My quip was quoted in a recent book review: "In this reviewer's opinion, the best definition—and the one that will command the widest agreement among economists—is still an unpublished one due to Professor Machlup: 'Dynamics is my theory; statics is the other fellow's theory.'" John S. Chipman, review of "La période dans l'analyse économique, une approche à l'étude due temps," by Raymond Barre, *Econometrica*, Vol. 22 (Jan. 1954), p. 126. Virtually the same remark was made by Samuelson: "We damn another man's theory by terming it static, and advertise our own by calling it dynamic." Paul A. Samuelson, *Foundations of Economic Analysis*, p. 311.

[44] William J. Baumol, *op. cit.*, pp. 11–12. Although John Stuart Mill is customarily not counted among the "classical" economists, he shared the views characterized as their "Dynamics." He was convinced of the "impossibility of ultimately avoiding the stationary state—this irresistible necessity that the stream of human industry should finally spread itself out into an apparently stagnant sea." John Stuart Mill, *op. cit.*, (London: Longmans Green, 1926), p. 746.

[45] Baumol, *op. cit.*, p. 19. Most other writers emphasize only the first two of the four fundamental laws. Cf. Paul Sweezy, *The Theory of Capitalist Development: Principles of Marxian Political Economy* (New York: Oxford University Press, 1942), pp. 92–93.

[46] Charles Gide and Charles Rist, *Histoire des doctrines économiques* (Paris: Recueil Sirey, 5th ed., 1926), p. 137. For the same reason Carlyle called economics the "dismal science."

of a "dynamic" model it is chiefly because theirs is a theory of historical development and economic growth. But also others, who do not see growth and development as the essence of dynamics but prefer to use this term to denote certain methods and techniques of analysis, have been able to attribute a "dynamic" approach to classical economists. For example, Pantaleoni states that the "famous essay by D. Ricardo on the depreciation of English paper money . . . is also a study of economic dynamics."[54] And Schumpeter regards Ricardo as a contributor to dynamics because of his conscious use of "period analysis."[55]

If thus the label "Dynamics" was so conspicuously bestowed on the classical economists, we must not overlook the label "Statics" which hangs there too. Indeed, for a long time it was highly fashionable to identify "classical" economics with "static" economics; members of the German and English historical schools never tired of criticizing and rejecting classical economics for its "statical" approach. (What many of these critics meant by "statical" approach, however, was the method of abstraction and isolation which they rejected in favor of a "totalistic" or "holistic" approach, comprehending the "*innerlich zusammenhängende, einheitliche Lebenstotalität des Volkes.*"[56])

Of course there is no reason why classical economics should not have been both "static" and "dynamic"—whatever this may mean—, static in some parts and dynamic in others. But the classical writers themselves did not indicate that they were conscious of employing two different approaches (as to subject matter or techniques of analysis)—except perhaps when they were speculating about future developments. This is altogether different with regard to one of their most famous critics, who was quite emphatic in differentiating his own approach from that of the classics on grounds of what has been called a thoroughly "dynamic" program. The "dissenter"[57] was Simonde de Sismondi.[58] His program is best described in Schumpeter's words:

> The distinctive feature of Sismondi's analysis is that it is geared to an *explicit dynamic model in the modern sense of this phrase.*
>
> He realized that the most important of the reasons why transitional phenomena are of the essence of the economic process—and hence not only relevant to its practical problems but also to its fundamental theory—is that the economic process is chained to certain sequences that will exclude certain forms of adaptation and enforce others.
>
> Sismondi's great merit is that he used, systematically and explicitly, a schema of periods, that is, that he was the first to practice the particular method of dynamics that is called period analysis. Moreover, he saw clearly the difference this makes and in particular the disturbances, discrepancies, and hitches that result from the fact that economic life is bound to sequences of which every unit is determined by the past and in turn determines the future.[59]

The features of Sismondi's work that prompted Schumpeter to call it "dynamic" are, of course, the methodological principles stressed in Schumpeter's definition of dynamics adopted "in deference to Professor Frisch." But also if dynamics is understood in some of the alternative senses can one find reasons for characterizing Sismondi' work as "dynamic." For example, it may be regarded as a study of historical economic development and of the evolution of economic institutions.

Friedrich List's work earned the label of "Dynamics" on similar grounds. It was essentially an analysis of the development of the "productive forces of the nation," a severe critique of the static foundation of classical free-trade theory, and an elaborate infant-industry argument for protective tariffs.[60] The putative dynamics of his work is pointed up in the following statement by Gide and Rist:

> List has enlarged the political horizon of the classical writers by substituting for their purely *static* conception a *dynamic* conception of the welfare of the nations. He introduced into the theory

[54] Maffeo Pantaleoni, *loc. cit.*, p. 31.

[55] Joseph A. Schumpeter, *History of Economic Analysis*, pp. 563–64.

[56] Julius J. Kautz, *Die Nationalökonomie als Wissenschaft* (Wien: Gerold, 1858), p. 320.

[57] Sismondi is treated as the first of the "adversaires" of the classical school. See Gide and Rist, *op. cit.*, pp. 199, 201.

[58] Jean Charles Leonard Simonde de Sismondi, *Nouveaux principes d'économie politique* (Paris: Delaunay, 1819).

[59] Joseph A. Schumpeter, *History of Economic Analysis*, pp. 494, 495, 496. (Italics in the original.)

[60] Friedrich List, *Das nationale System der politischen Ökonomie* (Stuttgart: Cotta, 1841).

of international trade what Sismondi had introduced into domestic economics: the preoccupation with the conditions of economic progress. Only that while Sismondi wanted progress to be slowed down List wanted it promoted.[65]

The system that qualifies for the attribution of "dynamics" on more scores than any other, or under the greatest variety of meanings given to the term, is "Marxian Dynamics." It does so as a theory of development, as a theory of a cumulative sequence, as a theory of historical evolution, as a general sociology interpreting the whole of social life, as a study of the evolution of institutions, as a model where all variables are functions of time, as period analysis, and probably on several other counts. One may wonder how Marx and Engels were able to do all this without using the word "dynamics." They used a substitute, though: "dialectics." To this term they gave just about all the meanings that other writers ascribed to "dynamics." In Engel's words, the "dialectical" method "grasps things and their images, ideas, essentially in their interconnection, in their sequence, their movement, their birth and death."[66] Much has been written about the extraordinary comprehensiveness—defeating all attempts at defining it—of the Marxian concept of dialectics. There can be little doubt that it embraces "dynamics" as one of its essential components—if not as its very essence.

Among the "dynamic" elements in the Marxian system are the theories of accumulation, reproduction on an enlarged scale, mechanization, constant re-creation of the industrial reserve army, progressively increasing misery of the masses, concentration of industry, falling rate of profit, recurring crises, and the inevitable downfall of capitalism. Because of this terminal state in the evolutionary sequence, it has been characterized as an "eschatological dynamic."[67] Schumpeter stresses in Marxian Dynamics the analysis of the sequence of evolutionary (endogenous) change, the

> fundamental idea . . . of a theory, not merely of an indefinite number of disjointed individual patterns or of the logic of economic quantities in general, but of the actual sequence of those patterns or of the economic process as it goes on, under its own steam, in historic time, producing at every instant that state which will of itself determine the next one.[68]

And Paul Sweezy affirms that Marx, chiefly through his theories of the industrial reserve army and of the progressive mechanization of the process of production,

> laid the foundation for a new and amazingly powerful attack on the problems of economic evolution . . . [and] . . . discovered one of the most important of the 'laws of motion' of capitalism which it was the announced intention of *Capital* to explore.[69]

The German Historical School has occasionally been characterized as dynamic economics, partly because of its objective to discover "the laws of the development of the economy of a nation,"[70] partly because of its attempts to formulate "stage theories" of economic development,[71] partly because of its "emphasis . . . on the concept of social

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[65] Gide and Rist, *op. cit.*, p. 339. (Italics in the original.)

[66] Friedrich Engels, *Herrn Eugen Dühring's Umwälzung der Wissenschaft* (Leipzig: Genossenschaftsbuchdruckerei, 1878); English translation *Herr Eugen Dühring's Revolution in Science: Anti-Dühring* (New York: International Publishers, 1935), p. 29.

[67] Cf. Kenneth E. Boulding, "A New Look at Institutionalism," *American Economic Review*, Proceedings, Vol. XLVII (May 1957), p. 9. Mises had called it a "chiliastic" theory, predicting the arrival of a millenium. Ludwig von Mises, *Die Gemeinwirtschaft: Untersuchungen über den Sozialismus* (Jena: Fischer, 2nd ed. 1932), pp. 250 ff.

[68] Joseph A. Schumpeter, *Capitalism, Socialism, and Democracy* (New York: Harper, 1942), p. 43.

[69] Paul M. Sweezy, *op. cit.*, pp. 93–94. Sweezy explained that the dynamics of the classics had been based primarily on the Malthusian law of population; that, when "facts" forced economists to "abandon" this law, they gave up exploring economic evolution and "proceeded to exclude questions of evolutionary processes from the field of systematic theorizing"; that Marx, who had rejected "all truck with Malthusianism," was an exception and by discovering "the principle of the [industrial] reserve army in place of the law of population" established a firm base for his dynamics.

[70] Wilhelm Roscher, *System der Volkswirthschaft* (Stuttgart: Cotta, 2nd. ed. 1857), p. 25.

[71] Karl Bücher, *Die Entstehung der Volkswirtschaft* (Tübingen: H. Laupp, 1893).

evolution,"[66] but chiefly because of its opposition to the "static" theory of classical economists.

In our survey John Maynard Keynes deserves a special place because of the intentional "dynamics" but putative "statics" which he produced. This divergence between intention and realization happened twice: first with his *Treatise* and again with his *General Theory*. In the Treatise he had declared that greater concern with "dynamical problems . . . will enormously increase the applicability of theory to practice," and that "This Treatise, in contrast to most older work on monetary theory, is intended to be a contribution to this new phase of economic science."[67] However, the critics of the *Treatise* were unanimous in the conclusion that Keynes' argument, especially his supposedly "dynamical equations" were "purely statical in type."[68]

Keynes himself, prefacing his next work, pleaded guilty for his earlier "lack of emancipation from preconceived ideas" and for the fact that "the dynamic development, as distinct from the instantaneous picture, was left incomplete and extremely confused."[71] But the renewed effort, though unequalled in all economic literature for its revolutionary impact upon contemporary thought, did not succeed in building a "dynamic" system. Indeed, "Mr. Keynes' system is still completely static," as Haberler summed up the results of several years of debate.[72] Many features of the system presented in the General Theory have been pronounced "essentially static"[73] in nature, but none more so than the interpretation of "the multiplier as an instantaneous relationship." Keynes apparently had an aversion to period analysis; "forget about periods!" he once told a student, according to a very credible report.[74]

In contrast to Keynes, Dennis H. Robertson is most widely acclaimed as an architect of economic dynamics, though he has never claimed to be one. "Robertsonian Dynamics" has become the accepted designation for period analysis based on the income-expenditure lag. Robertson himself, it seems, went out of his way to avoid using the word "dynamics." He can, however, be found to speak of "a more explicitly temporal method of analysis" and of an "analysis of processes of change, . . . following a step-by-step method, and starting again at each point in the light of all that has gone before"[75]—which describes perfectly what many mean by "dynamics."

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[66] Edmund Whittaker, *A History of Economic Ideas* (New York: Longmans, 1940), p. 737. In a most informative description of Gustav Schmoller's work, J. F. Bell writes: "Economic life, he believed, was a part of an active culture pattern which was both dynamic in an evolutionary sense and self-revealing. He believed that it was the task of economic science to determine the means or laws of this cultural exfoliation in its economic aspects, thus providing a sequence of cultural changes of growth and decline. Since history shows a repetitive sequence of events, a comprehensive record of past cultural developments would therefore provide a historical cultural prospective for the future. Short-run, environmental elements would not do more than briefly interrupt the cultural trend; they would not alter the final outcome of the dynamic march of cultural progress or of the cultural process. This reasoning provided Schmoller with a logical method of making historical inquiry the most important means of determining the laws of economic and other cultural development." John Fred Bell, *A History of Economic Thought* (New York: Ronald Press, 1953), pp. 341–342.

[67] John Maynard Keynes, *A Treatise on Money* (London: Macmillan, 1930), Vol. II, pp. 406–407.

[68] Evan F. M. Durbin, *The Problem of Credit Policy* (New York: Wiley, 1935), p. 248. With this verdict Durbin confirmed earlier opinions by F. A. Hayek, "Reflections on the Pure Theory of Money of Mr. J. M. Keynes," *Economica*, August 1931 and February 1932, Vol. XI; James E. Meade, *The Rate of Interest in a Progressive State* (London: Macmillan, 1933), and several others. For a good discussion see Arthur W. Marget, *The Theory of Prices*, Vol. I (New York: Prentice-Hall, 1938), pp. 101–140.

[71] John Maynard Keynes, *The General Theory of Employment, Interest and Money* (London: Macmillan, 1936), pp. vi–vii.

[72] Gottfried von Haberler, *Prosperity and Depression: A Theoretical Analysis of Cyclical Movements*. (Geneva: League of Nations, 3rd enlarged ed., 1941), p. 473.

[73] Joseph A. Schumpeter, *op. cit.*, p. 1174.

[74] *Ibid.*

[75] Dennis H. Robertson, "Some Notes on Mr. Keynes' General Theory of Employment," *Quarterly Journal of Economics*, Vol. LI (1936), pp. 172, 186. In an earlier article, Robertson speaks of a "treatment" that stresses "the successive existence of a short number of slices of time during each of which the money which appears as income for A cannot also appear as outlay by A (and therefore income for B)." D. H. Robertson, "Saving and Hoarding," *Economic Journal*, Vol. XLIII (1933), p. 413.

III. TYPOLOGY AND CLASSIFICATION

After listing the statements in which 39 authors attempted to say what they meant by Statics and Dynamics, and after discussing another group of economists whose work was characterized by other writers as either Statics or Dynamics, one should think that we now have a pretty good idea of these concepts. Unfortunately, we have gained only two strong impressions: one, that many of the authors in the first list were quite clumsy in expressing themselves, and some of them unsuccessful in saying clearly what they had in mind (assuming they had a clear conception); and secondly, that there is a great variety of meanings attached to the terms in question.

It might be an interesting undertaking to attempt interpretations of some of the obscure statements. When Mill spoke of a "stationary society," J. B. Clark of a "stationary state," Wicksell of a "stationary state of economic relations," Lindahl of "stationary conditions," Hayek of the "stationary state," Tinbergen of a "stationary position"—did they mean the same thing? Or were, as it seems more likely, five or six different ideas involved here? When J. B. Clark stressed for his Dynamics "the influence of five generic changes"—population, capital, technology, business organization, and tastes—did he mean merely a one-way direction of "influence" or did he mean a two-way street, a shuttle connection between variables in mutual interdependence? When Veblen formulated his incredibly ambitious program of searching for a body of theory that would account for practically everything—where "each new situation . . . embodies as causal factors all that has been effected by what went before"—did he mean what he said or was he merely exuberantly eloquent? Did J. M. Clark really want to put into Dynamics "everything that statics leaves out"?

This is only a small sample of the many questions raised by some of the statements collected in our list. We shall not take the time which such an interpretation would require. A different task seems more fruitful: an attempt to develop a typology and a classification of the distinctions made between Statics and Dynamics. If successful, a modicum of order may be brought into the semantic chaos. An earlier attempt, made over thirty years ago, was not successful. Rudolph Streller, in a monograph on the subject, proposed to sort the distinctions into the following five classes:[78]

I. The two concepts are equivalent to the two fields of "Theoretical Economics" and "Practical [Applied] Economics"—the customary division of economics in German universities.
II. The two concepts signify two branches of theoretical economics.
III. All economics is Dynamics; Statics does not exist.
IV. The two concepts refer to different subject matters, namely the study of "static countries" and the study of "dynamic countries."
V. Statics is the study of equilibrium conditions, Dynamics the study of the forces leading toward equilibrium positions.

It is perfectly correct that all of these meanings of Statics and Dynamics have been expressed in the literature and that authors can be cited for each of the five classes. But a good many authors could not be classed as representatives of any of these views. Moreover, some of the classes are so broad that very different types of distinctions between Statics and Dynamics would have to be left undifferentiated. For a better grasp, not only the obvious and conspicuous differences but also the finer nuances in the conceptions developed by different authors should be taken into account. Hence, we shall attempt to build a typology that accommodates most or all of the variants found in the literature.

It seemed expedient at first blush to separate the views according to which Statics and Dynamics meant two different *methods of analysis* from the views according to which they referred to two different *subject matters*. This has proved unworkable. One may say, for example, that a stationary economy and a growing economy, or the phenomenon of stationariness and the phenomenon of growth, are different subject matters. Yet, in order to understand why an economy is stationary, or fails to grow, one will need a theory of growth; and likewise, many aspects of growth will be better comprehended if recourse can be had to the theory of the stationary state. It just is not so that a certain model is useful only to the interpretation of situations which it depicts or schematizes. As a rule we need "contrasting models" in order to study the significance of whatever factors seem to be relevant in a given situation. For this reason, subject matter

[78] Rudolph Streller, *op. cit.*, pp. 38, 58, 77, 82, 89.

cannot be made a major independent criterion in the classification. Where authors insist on designating subject matter as the all-important difference between Statics and Dynamics, we shall have to regard this as an "extreme position." In other instances we shall have to lump "subject matter" and "basic approach" into one class.

The typology offered here will be arranged in the following six classes, the first containing absolute contradictories, the other five describing spectra or differences of degree:

A. Extreme positions

B. Regarding basic approach and subject matter

C. Regarding assumptions of invariance, independence, dependence and interdependence of particular variables

D. Regarding the use of the equilibrium concept

E. Regarding individual behavior and social facts

F. Regarding formal properties of variables.

A Classified Typology of Distinctions between Statics and Dynamics in Economics

A. *Extreme Positions*

Statics	*Dynamics*
1. The theory of my opponent	My own theory
2. Description of state of rest; hence, worthless as explanation of change	Explanation of change; hence, the only useful theory ("There is no meaningful statics")
3. Method of holding other things constant; hence, the only possible technique of reasoning ("There is no meaningful dynamics")	Method of looking at the complex totality of phenomena, with everything changing at once; hence, worthless for explaining anything
4. Naive speculation about imaginary world, based on unrealistic assumptions	Realistic study of the real world, based on observed facts
5. Method of explaining certain things by taking other things as data	Method of taking nothing as datum, attempting to explain everything
6. Theory applicable only to "static" (stagnant) economies	Theory applicable only to "dynamic" (developing) economies

B. *Regarding Basic Approach and Subject Matter*

Statics	*Dynamics*
1. Pure theory: model building, using abstractions, constructions, isolation, idealization	Applied economics: dealing with empirical "reality" in all its complexity
2. Theoretical construction abstracting from historical time	Historical description of observed sequences in historical time
3. Theory of exogenous changes: adjustments to assumed (given) events or changes	Theory of endogenous changes: explanation of changes evolving without "disturbances" from outside
4. Theory of the stationary state	Theory of growth and fluctuations
5. Theory of relative prices and output: analyzing decision making, adjustments of costs, prices, outputs, allocation of resources, and distribution of income	Theory of accumulation and progress: analyzing saving, investment, and technical change, and effects on productivity, employment, and income
6. Theory of value and distribution: the same as Statics B 5	Theory of evolution of institutions, including stage theories of economic systems
7. Theory of variation yielding conditional predictions of effects of particular changes *ceteris paribus*	Theory of development yielding unconditional predictions of tendencies in a distant future
8. Taxonomic and tautological economics	Empirical economics

B. *Regarding Basic Approach and Subject Matter* (cont'd)

Statics	*Dynamics*
9. Abstract economic theory isolating idealized patterns of action under given social institutions	Holistic social theory dealing with the "whole" social process and the change of institutions
10. Analytic method (in Marxian sense)	Dialectic method (in Marxian sense)

C. *Regarding Assumptions of Invariance, Independence, Dependence and Interdependence of Particular Variables*

Statics	*Dynamics*
1. Assuming population, capital stock, technology, business organization, and tastes—and social institutions—to change only one at a time, and analyzing the effects (adjustments)	Assuming population, capital stock, technology, business organization, and tastes to change simultaneously—as independent variables or as functions of time—and analyzing the process and the effects
2. Assuming the same as Statics C-1 or as Dynamics C-1	Assuming population, capital stock, technology, business organization and tastes to change in the course of any sort of process—as dependent variables—and analyzing the causes and interactions as well as the process and the effects
3. Assuming capital stock, technology, and business organization to be unchanged, allowing population and tastes (and some institutions?) to change, and analyzing the effects (adjustments)	Assuming capital stock, technology and business organization to change in consequence of entrepreneurial innovation (and of bank credit creation) and analyzing the causes and interactions as well as the process and the effects
4. Assuming the fundamental social institutions to be unchanged, allowing everything else to change, and analyzing the effects (adjustments)	Assuming all conditions including fundamental social institutions to change in the course of any sort of process, and analyzing the causes and interactions as well as the process and the effects

D. *Regarding the Use of the Equilibrium Concept*

Statics	*Dynamics*
1. Analyzing the formal properties of equilibrium, disregarding transitions or the process of equilibration	Analyzing the forces effecting the changes in economic quantities that are required for equilibrium to be approached, attained, maintained, restored
2. Analyzing the conditions of equilibrium, but not the forces at work to attain, maintain, or restore equilibrium	Analyzing the paths toward equilibrium and the effects on the outcome of different sequences in the equilibrating process
3. Assuming all data, after the initial disturbing change, to remain unchanged during the process of equilibration	Assuming data to change further before equilibration is completed; hence, hypothesizing a moving equilibrium that can never be attained ("Moving equilibrium")
4. Assuming all responses to lead toward positions of equilibrium	Assuming some responses to engender cumulative processes leading to progressive deviations from equilibrium ("Cumulative process")
5. Assuming equal reaction speeds of dependent variables in the process of equilibration	Assuming unequal reaction speeds of dependent variables, resulting in sequences that may or may not tend to eventual equilibrium ("Sequence analysis")

D. *Regarding the Use of the Equilibrium Concept* (cont'd)

Statics	*Dynamics*
6. Comparing consecutive or alternative equilibria ("Comparative statics")	Tracing consecutive disequilibria as a sequence in time ("Sequence analysis")
7. Assuming indifference of outcome to the order of steps in the process of equilibration if shown as a sequence	Assuming dependence of outcome on the order of steps in a sequence which may or may not approach equilibrium ("Period analysis")
8. Analyzing the simultaneous consistency of interrelated variables, disregarding the possible realizations of the expectations of decision makers in the future	Analyzing the compatibility of plans, decisions, and expectations with regard to their possible realizations over time ("Intertemporal equilibrium")
9. Assuming absence of anticipations of changes in prices or other conditions, and absence of allowances for subjective uncertainty	Analyzing the effects of uncertain expectations and anticipations of changes in prices or other conditions

E. *Regarding Individual Behavior and Social Facts*

Statics	*Dynamics*
1. Explanation of certain changes as adjustments to exogenous causes by individuals and firms responding to altered opportunities and given preferences	Explanation of certain changes as emanations from within the economic system (endogenous changes) in the form of innovating actions of entrepreneurs (financed by new money)
2. Focus on the ideal type of economic man, constructed with unchanging postulates about individual motivation and action	Focus on the "whole man" and on the totality of changing social facts, especially "social wholes"
3. Deductions from assumption of universal pattern of individual action	Empirical observation of social facts and aggregative quantitative information
4. Qualitative reasoning starting from the individual	Quantitative research starting from statistical data, especially time series over long periods

F. *Regarding Formal Properties of Variables*

Statics	*Dynamics*
1. Using only undated variables	Using only dated variables
2. Connecting quantities referring to the same point or period of time	Connecting quantities referring to different points or periods of time
3. Assuming no time lags	Assuming time lags, using lagged variables
4. Omitting time as an independent variable	Making some or all quantities functions of time
5. Emphasizing as variables prices and quantities	Emphasizing as variables differences, rates of change, derivatives with respect to time

It must be admitted that, in an attempt to keep the number of classes down, their characteristics have been formulated somewhat loosely and broadly but, nevertheless, some of the types of distinction will be fitted only with considerable strain into one of the boxes so provided. It must further be admitted that some of the differences between separate types of distinction are so small, or merely verbal, that two or three of the types could just as well have been telescoped into one; on the other hand, further subdivisions could have been made if minor nuances of details were considered sufficiently important. All this is natural in the description of spectra. It is a matter of taste how far one wants to go in dividing a spectrum of ideas.

Duplication, or even multiple entry, has been unavoidable because certain meanings of dynamics combine several criteria and thus represent at the same time several different types.

Take, for example, Schumpeter's theory of economic development, which he once regarded as the prototype of "dynamics" (before he generously accepted Frisch's definition). This Schumpeterian Dynamics would fit types B-3 (endogenous change), B-4 (growth and cycle theories), B-5 (accumulation theory), C-3 (giving to technology, business organization, and capital stock the status of dependent variables), D-3 (moving equilibrium), D-4 (cumulative processes), D-5 (sequence analysis), E-1 (innovating activity of "dynamic" entrepreneurs), as well as F-1, F-2, and F-3 (dated, inter-period, lagged variables). Many of the theories that are widely recognized as dynamic will qualify as more than one type of dynamic.

Some of the separate and apparently different criteria are in fact closely linked with one another, if they are not logical correlatives. A theory of growth will be closely associated with a theory of capital accumulation; this, in turn, will be a theory of endogenous change, and the resulting processes and sequences will be analyzed under any of the assumptions concerning reactions, responses, etc. The "endogenous" changes themselves, on the other hand, can readily be interpreted in terms of the "equilibrations" on the part of consumers-savers and entrepreneurs-investors responding to alternative opportunities and given preferences. Thus, a good many "categorical" distinctions are merely different ways of looking at the same things.

Several of the distinctions proposed in the literature and included in our list suggest contrasts and contradictions which disappear on closer inspection. Many writers, for example, have believed that "equilibrium economics" and "evolutionary economics" were diametrical opposites; in fact, however, the equilibrium concept can often be used in explaining an evolutionary sequence and, indeed, it may be impossible to explain certain processes that are part of an evolutionary sequence without the use of the equilibrium concept. Thus, an evolutionary sequence may (a) employ "temporary" equilibria as explanatory devices, and (b) assume the eventual attainment of (or close approach to) an "ultimate" equilibrium. Cases in point, to name only a few, are Classical Dynamics, Marxian Dynamics, and the converging-cobweb theorem. To illustrate by Marxian Dynamics: the very essence of the "dialectic" scheme is a sequence of "syntheses," which are equilibria in the short run as well as disequilibria from a longer-term point of view; and the eventual emergence of socialism is the ultimate equilibrium, the terminal synthesis in the chain of contradictions. Undoubtedly, if "dynamics" were defined by the non-use of the equilibrium concept it would become a rather empty category; at least, many types of economic analysis, now safely regarded as "dynamic," would no longer so qualify.

IV. COMPLAINTS ABOUT CONFUSION

Over the years, there has been a long procession of economists lamenting the semantic confusion about the pair of terms under review. Some of the complainants tried to repair the situation by prescribing what economists *ought* to mean when they speak of Statics and Dynamics; each prescription added one more to the many conflicting and confusing distinctions already in stock. Other complainants confined themselves to surveying and analyzing the conceptual and terminological muddle.

The number of articles and books devoted exclusively to discussions of Statics and Dynamics is remarkable. Some of them we have cited above—Pantaleoni, Kondratieff, Streller, J. M. Clark, F. H. Knight, Kuznets, Frisch, Harrod, Hart, Samuelson, Baumol. But this is by no means an exhaustive list. Most probably it omits more than it includes. To name some omissions of which I am fully aware, there is an essay by Simon Patten,[77] a second book by Streller,[78] articles by Barone,[79] Amonn,[80] Honegger,[81] Roos,[82]

[77] Simon N. Patten, *The Theory of Dynamic Economics*, Publications of the University of Pennsylvania, Political Economy and Law Series, Vol. III, No. 2. (Philadelphia: Univ. of Pennsylvania, 1892).

[78] Rudolph Streller, *Die Dynamik der theoretischen Nationalökonomie* (Tübingen: Mohr-Siebeck, 1928).

[79] Enrico Barone, "Sul trattamento di quistioni dinamiche," *Giornale degli Economisti*, Serie II, Vol. IX (1894), pp. 407–435.

[80] Alfred Amonn, "Die Probleme der wirtschaftlichen Dynamik," *Archiv fur Sozialwissenschaften und Sozialpolitik*, 38. Bd. (1914).

[81] Hans Honegger, "Zur Krisis der statischen Nationalökonomie," *Schmollers Jahrbuch für Gesetzgebung, Verwaltung und Volkswirtschaft im Deutschen Reiche*, 48. Jahrg. (1924), pp. 473–490.

[82] Charles F. Roos, "A Dynamical Theory of Economics," *Journal of Political Economy*, Vol. XXXV (1927), pp. 632–656.

Moretti,[43] Demaria,[44] Goetz-Girey,[45] Samuelson,[46] and a frequently cited book by Roos.[47] But in addition there are many articles on the subject that have appeared over the last fifty years in Italian, German, French, Dutch, Scandinavian journals, which I have not consulted, plus a number of books in these languages. Finally there are now innumerable publications on the "dynamics" of particular subject matters, such as the "dynamics of competition," "dynamic distribution theory," "dynamic programming theory." Does this mean that agreement has been reached about the meaning of the terms in question?

Agreement with a particular set of formal definitions of Statics and Dynamics would not be enough to remove the confusion, as Kuznets has rightly observed, for "there is confusion as to the actual scope and relation of these two bodies."[48] But we are far from an agreement on definitions either. Knight alludes to "the lack of effort at clear definition" and "the paucity of discussion of their [the terms'] meaning."[49] Rosenstein-Rodan calls them "terms of such ambiguity that their use is often positively misleading."[50] Sombart calls the distinction *"zweifellos das dürftigste Schema"* for dividing economic analysis; he remonstrates against the continuous "confusions of the working constructs of static and dynamic states with the empirical concepts of changelessness and change"; and he denounces "the authors who speak of statics but mean traditionalism, and speak of dynamics but mean progressivism."[51]

Schumpeter likewise decries the incessant confusions between static and stationary, and between dynamic and evolutionary.[52] Most writers, he says, confuse "static theory" with the "theory of the stationary state,"

> witness the growing popularity of the phrase 'static state,' which is the hallmark of this confusion. Nevertheless, though more clearly visualized than rigorously defined, the system of economic statics did emerge during the period and in fact constitutes its great achievement. But the nature of economic dynamics was not even clearly visualized—some identified it with a historical theory of change or else with a theory that allows for trends; others with a theory of general interdependence as against partial analysis of sectional phenomena; still others with a theory of a modern as against the tradition-bound economy of the Middle Ages; and a few simply with the theory of small variations of economic quantities... And there were those in whose hands the whole discussion degenerated into a quarrel about words. All this goes to show the importance, even for purely practical purposes, of logically rigorous definitions...[53]

The sternest strictures came from Ewald Schams, who scoffed at the use of "this pretty pair of names" with unknown or unclear meanings. The "peculiarity of a perfect agreement about the terminology" combined with a "perfect disagreement" about its meaning is attributed to the fact that the terms were rashly taken over from a different field. And "now one struggles manfully to find for the two names some sensible contents that would tolerably well fit the subject"; and under the strange influence of the pair of names one feels under a compulsion to divide the subject into two parts, no matter whether it makes sense or not. Schams believes it makes no sense.[54]

This conclusion is too severe. The trouble, as I see it, is not that the division of economic analysis into Statics and Dynamics makes *no* sense, but that it makes *too many* senses. Per-

[43] Vincenzo Moretti, "Sopra alcuni problemi di dinamica economica," *Giornale degli Economisti*, Serie IV, Vol. LXIX (1929), pp. 449–488.

[44] Giovanni Demaria, "Saggio sugli studi di dinamica economica," *Rivista Internationale di Scienze Sociali*, Anno XXXVIII, Serie III, Vol. I (1930), pp. 107–130, 222–257.

[45] Robert Goetz-Girey, "Statique et dynamique économiques dans la science allemande contemporaine," *Revue d'Economie Politique*, Vol. L (1936), pp. 1308–1330.

[46] Paul A. Samuelson, "Dynamics, Statics, and the Stationary State," *Review of Economic Statistics*, Vol. XXV (1943), pp. 58–61.

[47] Charles F. Roos, *Dynamic Economics: Theoretical and Statistical Studies of Demand, Production and Prices* (Bloomington: Principia Press, 1934).

[48] Simon Kuznets, *loc. cit.*, p. 32.

[49] Frank H. Knight, "Statik und Dynamik," *loc. cit.*, p. 1; *Ethics of Competition*, p. 161.

[50] Paul N. Rosenstein-Rodan, "The Role of Time in Economic Theory," *Economica*, New Series, Vol. I (1934), p. 77.

[51] Werner Sombart, *Die drei Nationalökonomien* (München: Duncker & Humblot, 1930), p. 187.

[52] Joseph A. Schumpeter, *History of Economic Analysis*, p. 964.

[53] *Ibid.*, pp. 966–67.

[54] Ewald Schams, "Komparative Statik," *Zeitschrift für Nationalökonomie*, Vol. II (1930), pp. 33, 61.

haps this is even worse; non-sense can be shrugged off with a laugh, but multiple sense may be a real nuisance. It involves, in this instance, less the danger of snags and snares in economic theorizing than the waste of time in trying to understand one another.

The danger of a failure to understand one's partner in discussion is serious. Remember that for Schumpeter "Dynamics" once was the theory of development, but later he warned against confusing growth and development theories with "Dynamics." And just when he and others had declared that by Dynamics they would mean period analysis and lagged variables, Harrod announced that Dynamics was growth theory after all. Price theory, based on assumptions of given cost and demand, was definitely Statics for Harrod and many others; yet, when analyzed with different reaction speeds and sequences, with time lags and alternative paths towards equilibrium, price theory became Dynamics for many economists. The notion of equilibrium, as we have seen, is widely held to be a characteristic of Statics, and Dynamics to be completely divorced from equilibrium theory; but to many, perhaps most, writers Dynamics is equilibrium analysis of a particular kind, namely, with emphasis upon the time aspects of the process of equilibration.

Although all this recalls to our attention only a small part of the wide choice of meanings, it is enough to establish the point that the words Statics and Dynamics do not convey a definite meaning unless the speaker or writer has given prior notice of his semantic intentions. There are some who do so in a rather authoritarian fashion by declaring, not what they propose to mean, but what Statics "*is*," and what Dynamics "*is*." This, considering the existence of dozens of conflicting views stated by economists in good standing, betrays a lack of humility on the part of the defining author, who evidently thinks of himself as *the* authority on the subject.

One may discover a convergence in recent years, especially among writers using mathematical forms of expression, toward the "lagged variables" view of Dynamics. This convergence may be enough to permit the reader's presumption that the inclusion of lagged variables in a model is what these writers mean when they refer to Dynamics. But, of course, there are hundreds of writers whose models have no curves and no figures, nor any alphabetic symbols; and there are even writers who do not know that their models are models, but whose prose teems and buzzes with "Dynamics" and "dynamic."

The need for a declaration of semantic intentions reduces the usefulness of the words in question in oral discussions among people with unknown commitment to word meanings. They can be useful in an economic monologue, in a course of lectures, or a treatise, for there it is possible to announce in the beginning what will be understood by the terms. For general use in discussion, however, words the meaning of which cannot be understood without explanation even in the context in which they are used cannot be recommended.

Thus, whenever another, more readily understood word or phrase is available in lieu of either Statics or Dynamics, it should be preferred. For example, when Dynamics is to mean Growth Theory, we are certainly better off saying Growth Theory in the first place. When Statics is to mean Theory of the Stationary State, we can use this (admittedly longer) phrase and avoid the ambiguous "Statics." When Dynamics is to refer to the history or to the theory of the evolution of economic institutions, we should use these longer but self-explanatory phrases. When it refers to Time-Series Analysis, to Trend Analysis, to Sequence Analysis, to Period Analysis,—all these are more or less descriptive terms, far superior to "Dynamics." Probably more often than not we should be able to do without the terms Statics and Dynamics.

MARKET CLASSIFICATION SYSTEMS IN THEORY AND POLICY

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I. INTRODUCTION

In two seminal papers published in the mid-thirties, Nicholas Kaldor suggested that types of market organization can be determined by reference to elasticities and cross elasticities of demand.[1] This classificatory approach has proved to be very popular, especially since the appearance of Robert Triffin's study on *Monopolistic Competition and General Equilibrium Theory*.[2] Indeed, many alternative and conflicting systems have been advanced; yet it does not seem that the most relevant economic questions have been answered.[3]

In the first instance, it is uncertain whether these systems of classification are designed for the purpose of theory or for the purpose of public policy. This is actually an important issue, because a system designed for theoretical purposes must be *operationally meaningful*, but one designed for public policy must also be *operationally feasible*. A second question is whether the elasticity classification should refer to anticipated (subjective) demand functions or to objective market functions. Only one writer, Triffin, has been clear on this point;[4] however, no classification scheme has been suggested that directly relies upon entrepreneurial expectations.

The objective of this paper is to review the present state of elasticity classification and suggest some alternatives that are more appropriate according as the specific purpose is theory or public policy. To do so, we shall first discuss three important contributions to the field.

II. EXISTING SYSTEMS OF CLASSIFICATION

Although numerous writers have suggested different methods of classifying market relationships, the particular systems of Triffin, Andreas G. Papandreou, and Robert L. Bishop are discussed becaused they represent the most extensive developments of the subject.[5]

A. Triffin's Classification of Market Organization

To develop his system of market classification, Triffin defines two coefficients of cross elasticity:[6]

$$(1) \qquad \eta_{ij} = \frac{\partial q_i}{\partial p_j}\frac{p_j}{q_i}, \qquad \epsilon_{ji} = \frac{\partial p_j}{\partial q_i}\frac{q_i}{p_j},$$

where p and q represent price and quantity and i and j are subscripts denoting firms. These two coefficients are the price and quantity cross elasticities respectively. Then if

$$(2) \qquad \eta_{ij} \to \infty,$$

[1] N. Kaldor, "Mrs. Robinson's 'Economics of Imperfect Competition,'" *Economica*, N.S. I (1934), pp 335–41; "Market Imperfection and Excess Capacity," *ibid.*, II (1935), pp. 33–50.

[2] R. Triffin, *Monopolistic Competition and General Equilibrium Theory* (Cambridge: Harvard University Press, 1940).

[3] See E. F. Beach, "Triffin's Classification of Market Positions: Comment," *Canadian Journal of Economics and Political Science*, IX (1943), pp. 69–74; R. L. Bishop, "Elasticities, Cross-Elasticities and Market Relationships," *American Economic Review*, XLII (1952), pp. 779–803; E. H. Chamberlin, "Measuring the Degree of Monopoly and Competition," in *Monopoly and Competition and Their Regulation*, E. H. Chamberlin, ed. (London: Macmillan, 1954); William Fellner, *Competition Among the Few: Oligopoly and Similar Market Structures* (New York: Alfred A. Knopf, 1949); T. Morgan, "A Measure of Monopoly in Selling," *Quarterly Journal of Economics*, LX (1946), pp. 461–3; A. G. Papandreou, "Market Structure and Monopoly Power," *American Economic Review*, XXXIX (1949), pp. 883–97; S. Weintraub, "The Classification of Market Positions: Comment," *Quarterly Journal of Economics*, LVI (1942), pp. 666–73.

[4] *Op. cit.*, pp. 78–90.

[5] For citations, see footnotes 2 and 3 above.

[6] *Op. cit.*, pp. 99–108 and 137–41.

a small reduction in p_j reduces q_i to zero. According to Triffin, this affords "... an economic indication of the homogeneity of the goods sold by the two firms." Consequently, this category is designated *homogeneous competition*.

In the opposite case, when

$$\eta_{ij} \to 0, \tag{3}$$

a slight reduction in p_j leaves q_i completely unaffected. The firms are entirely unrelated; therefore, if (3) is satisfied for all j, the case of *pure monopoly* or *isolated selling* is distinguished. Finally, if

$$0 < \eta_{ij} < \infty, \tag{4}$$

the market is characterized by *heterogeneous competition*.

In the first and last categories, when the firms are in competition, the criterion thus developed does not discriminate between situations in which the relationship is circular and those in which it is not. For this purpose, Triffin calls upon his coefficient of quantity cross elasticity. If η_{ij} is significantly different from zero, then oligopolistic circularity is present or not according as ϵ_{ji} is greater than or equal to zero. That is, if some firms j that influence i are themselves affected by the price policy of i, then circularity prevails.

One primary criticism has been voiced against Triffin's system of classification by several writers, e.g., Sidney Weintraub, Papandreou, and E. H. Chamberlin. Specifically, in homogeneous, non-oligopolistic competition, the coefficient of price cross elasticity is zero rather than infinite. Some have shown this by using elasticity coefficients based upon finite differences rather than the differential calculus. Papandreou argues that while $\eta_{ij} \to \infty$ *potentially*, the *realizable* value is zero. For this reason, as is subsequently shown, he introduces a second measure that accounts for market realities. The crux of Papandreou's criticism is that Triffin fails to acknowledge the realizable features of the market.

The arguments of Papandreou and others clearly show that in a truly homogeneous, non-oligopolistic market, one entrepreneur cannot encroach upon the market of another by price policy. However, we should like to go further and argue that in such a market, even the price cross elasticity with reference to anticipated demand is zero. Or, in Papandreou's terminology, both the potential and the realizable values of η_{ij} are zero. This may be established by either of two lines of reasoning.

The first of these emphasizes the public policy aspect of classification. In public policy, based upon the traditional price-marginal cost equality theorem of welfare economics, the price policy of a firm is of central importance. That is to say, one classifies firms according to their price policies. Now price policy is predicated upon a firm's or an entrepreneur's evaluation (i.e., anticipation) of the existing market conditions; from this standpoint, a firm is an homogeneous, non-oligopolistic competitor only if the entrepreneur regards price as market determined. Hence the expected demand function is

$$p_i = \text{a constant}, \tag{5}$$

so that any derivative, and thus cross elasticity, is zero.

By the line of reasoning presented above, for the purposes of public policy, an entrepreneur is an homogeneous competitor only if he acts as if he were. Our second reason for asserting that $\eta_{ij} = 0$ is designed to show that, at least over time, an entrepreneur must learn rather accurately the exact nature of his position vis-à-vis competitors. Consider an entrepreneur operating in an homogeneous, non-oligopolistic market, but suppose that he believes $\eta_{ij} \neq 0$. Then, according to conventional theory, he will change his price experimentally in order to determine the price that yields maximum profit. Since he thinks $\eta_{ij} \neq 0$, he will closely observe the reactions of his competitors during the process. But the market is, by hypothesis, one of homogeneous, non-oligopolistic competition, so the observed reactions will be nil. Furthermore, by the nature of the market, he must recognize that when his price is set either above or below the prevailing market price, his profit diminishes. Accordingly, over some period of time, the entrepreneur must determine that he is indeed an homogeneous, non-oligopolistic competitor and, consequently, anticipate a demand function such as that given by equation (5).

B. Papandreou on Market Structure

As we have previously stated, Papandreou criticizes Triffin's statement that, in perfect competition, demand cross elasticity is infinite. On the contrary, it is zero, in terms of actual or realizable changes in the volume of sales. Thus,

according to Papandreou's analysis, one cannot distinguish between perfect competition and perfect monopoly on the basis of elasticity. Papandreou then suggests that a new coefficient is needed which ". . . should take into account the capacity of the firm which attracts demand units by cutting price to match them with supply units." He terms this the *coefficient of penetration* since ". . . it measures the capacity of the firm to cut into the volume of another firm's sales by reducing price."[7]

The coefficient of penetration is defined as

$$\rho_{ij} = k_j \eta_{ij} \tag{6}$$

where k_j is restricted to the positive unit interval, i.e., $0 \leq k_j \leq 1$. Papandreou states that k_j is an index of the capacity of firm j to match with supply units the demand units which shift to it following the price reduction. Thus "It (k_j) may be thought of as a function of the price elasticity of demand for the product of the price-cutting firm, and of the elasticity of an output-outlay function." This factor is then given more explicitly by the following equation:

$$k_j = \phi(\eta_{jj}, \theta_j), \tag{7}$$

where θ_j is the elasticity of the output-outlay function.[8]

The exact form of the ϕ-function is not known; however, one can say that it is an increasing function of the elasticity of the output-outlay function and a decreasing function of the elasticity of good j with respect to its own price. The closed unit interval of k_j values is specified since the firm's ability to match demand units with supply units is either perfect, nil, or intermediate between these extremes. That is, penetration is possible to the extent that the supply units are available. The availability of these units depends, in turn, upon the responsiveness of output to increases in input and upon the expansion of the firm's existing demand consequent to a price reduction.

Using a combination of cross elasticity and penetration coefficients, Papandreou advances the following market classification:[9]

Atomistic homeopoly	$\eta_{ij} \to \infty, \quad \rho_{ij} = 0$
Atomistic heteropoly	$0 < \eta_{ij} < \infty, \rho_{ij} = 0$
Circular homeopoly	$\eta_{ij} \to \infty, \quad \rho_{ij} > 0$
Circular heteropoly	$0 < \eta_{ij} < \infty, \rho_{ij} > 0$
Pure monopoly	$\eta_{ij} \to 0$

A few points of criticism may now be noted. In the first place, the case of circular homeopoly is not defined in the Papandreou analysis. This may be seen by writing equation (6) as

$$k_j = \frac{\rho_{ij}}{\eta_{ij}}. \tag{8}$$

Now invoke the condition that $\eta_{ij} \to \infty$. Then one of two cases must result. If $0 \leq \rho_{ij} < \infty$, then $k_j \to 0$, implying that the entrepreneur in question cannot penetrate rival markets. That is, we have the case of atomistic homeopoly, rather than circular homeopoly. On the other hand, if $\rho_{ij} \to \infty$, then k_j has the indeterminate form ∞ / ∞, but it has previously been specified that k_j lies in the unit interval. Consequently, in this system, there is no technique for distinguishing a group of oligopolists producing an homogeneous product.

The difficulty in defining circular homeopoly arises from the requirement that the cross elasticity coefficient approach infinity. If this coefficient were considered finite and positive, as in the case of circular heteropoly, the coefficient of penetration could range over positive, finite values. The trouble with this proposed amendment is that the case of circular homeopoly becomes identical with the case of circular heteropoly, so far as Papandreou's system would show. We will argue later that this is a difficulty that cannot be removed by the use of elasticity coefficients but that can be removed by consideration of entrepreneurial expectations.

The condition that the cross elasticity coefficient approach infinity in the circular homeopoly case is very dubious on economic grounds, as well as on mathematical grounds. Essentially, it implies that, because of homogeneity of the products, one competitor will lose his entire sales if he raises his price. This is clearly not true if his

[7] Papandreou, *op. cit.*, p. 890.

[8] The output-outlay function, according to Papandreou, is the inverse of the total cost function. Accordingly, the elasticity of the output-outlay function is the reciprocal of the elasticity of the total cost function. Therefore, θ_j is the ratio of average cost to marginal cost for firm j.

[9] *Op. cit.*, pp. 894–7.

rivals cannot supply the entire quantity that will be demanded. For example, it is clearly not true in the limit of the Edgeworth duopoly case. In this instance, the sellers reduce the market price to a preassigned minimum. Then one seller notes that it is profitable for him to raise his price because his rival cannot produce an amount sufficient to deprive the higher-priced seller of a considerable share of the market. Hence, while cross elasticity is positive, it will not approach infinity.

Similarly, if a realistic construction is placed on the phrase "homogeneous product," spatial influences may enable an oligopolist to retain a share of the market even though his price is above that of competitors. For reasons of convenience or of economy in transportation costs, buyers situated near the higher-priced seller may purchase from him despite his slightly higher f. o. b. price. It is recognized that in a strict interpretation, these sellers are not offering homogeneous products since there are locational differences. But it seems doubtful that the strict construction can be maintained for purposes of public policy, although there may be other types of problems in which it is desirable to theorize on a level of abstraction that excludes considerations of space.

An additional point concerns the usefulness of the penetration coefficient. It seems obvious that Papandreou's classification system is for the purpose of public policy, in which case it must be operationally feasible. Now if one considers only the public policy aspect, what is the role of the penetration coefficient? We think that it may be taken as axiomatic that price policy is the basic issue in the social control of business. Fundamentally, it is the departure from some established norm of price policy that is likely to provoke action by the Justice Department. If this is true, the coefficient of penetration is not helpful in determining the firms that should be prosecuted. However, knowing which firms to prosecute, this coefficient will tell the Justice Department the ones to prosecute first. That is, by showing the extent to which a firm can penetrate a market, it (ρ_{ij}) indicates the ability of a firm to undertake aggressive price policies.

The third point for discussion concerns the subjective or objective character of the demand function. This is not covered by Papandreou, but it is clear from his arguments that the η_{ij} relevant for the function of equation (7) is determined from an objective market demand curve. Thus, we must be prepared to use two different meanings for η_{ij}, or to accept a fully objective approach. It seems that the latter is unrealistic, since expectations rather than actualities determine price policy.

The final issue is Papandreou's use of $\eta_{ij} \to \infty$ in the case of atomistic homeopoly. This point has been discussed in detail in the previous section, so the argument is not repeated here. We regard all of these criticisms of Papandreou's system of classification as pointing out technical difficulties rather than as raising fundamental objections. Indeed, we regard his concept of penetration as essential to an adequate system of market classification; but we prefer to use his k_j rather than the coefficient of penetration itself.

C. Bishop on Market Organization

The paper by Bishop is primarily a critique of previous work; however, he does inject one new and startling element into the discussion. Specifically, Bishop says that

$$-\frac{\eta_{ii}}{\eta_{ji}} = n - 1 \quad \text{or} \quad n_i - 1, \tag{9}$$

where n is the number of competitors in the group and n_i is the ratio of business done by all members of the group to that done by firm i. The use of n is appropriate when all firms are of equal size; otherwise, n_i is the relevant concept.[10]

In light of equation (9), Bishop develops a system of market classification based upon straight price elasticity and a numbers or numbers-equivalent concept. However, since equation (9) is invalid in any general situation, the suggested classificatory scheme is also.

To exhibit clearly the fallacy of Bishop's argument, we review his demonstration. Let a product group be composed of 101 firms producing differentiated but closely related goods. He then postulates that the firms produce identical quantities of their differentiated commodities and sell them at a uniform price. Bishop further suggests that we assume $\eta_{ii} = -5$.

Then, according to his argument, a change in p_i has equal effects on quantity sold by every other member of the product group. This statement, as shown below, is true. Now as the i-th

[10] Bishop, *op. cit.*, p. 786.

firm reduces its price p_i, the quantity sold x_i increases by a multiple of five times the price reduction. This statement is also true, but now the fallacy enters. Bishop argues that the increase in x_i comes in one-hundred equal installments from the one hundred other members of the group. Thus the change in x_i is exactly one-hundred times the change in x_j $(j \neq i)$. Consequently, Bishop says, since η_{ii} and η_{ji} are related to the same price change, it follows that $\eta_{ji} = 0.05$, or $-\eta_{ii}$ divided by 100. This establishes his numbers formula.

The basic error in the argument lies in the assumption that x_i increases by exactly the sum of the decreases in x_j for all $j \neq i$. It may be noted parenthetically that this assumption is entirely analogous to the zero-sum principle so frequently used in game theory. But the Bishop assumption is not generally valid, since a decrease in price not only attracts purchasers from among the present clientele of other producers; it also attracts new customers and stimulates an increase in quantity demanded by old customers. Thus the increase in x_i might exceed the sum of reductions in x_j by a substantial amount. In other words, unless demand is completely inelastic, markets do not behave in a manner consistent with the zero-sum assumption.

The Bishop example can perhaps best be refuted by a counter example. Let us consider a product group which, for convenience, we assume to be composed of three firms. Let these firms conform to the conditions of the Bishop illustration and construct objective demand functions which satisfy the usual conditions imposed upon demands for related goods. Specifically, the functions are constructed so as to satisfy the Hotelling symmetry conditions[11] and so that the coefficients form a negative definite matrix:

$$x_1 = -5p_1 + p_2 + p_3 + 4, \tag{10}$$

$$x_2 = p_1 - 5p_2 + p_3 + 4, \tag{11}$$

$$x_3 = p_1 + p_2 - 5p_3 + 4. \tag{12}$$

Let $p_1 = p_2 = p_3 = 1$; thus $x_1 = x_2 = x_3 = 1$. Furthermore, for any reduction in p_1, these equations yield equal quantity reductions for firms 2 and 3. For example, if p_1 is reduced to $\frac{1}{2}$, $x_2 = x_3 = 1\frac{1}{2}$, a loss of one-half unit each. The fallacy in Bishop's argument can be demonstrated by continuing the example. When p_1 is reduced to $\frac{1}{2}$, $x_1 = 3\frac{1}{2}$, an increase of $2\frac{1}{2}$ units in sales, whereas firms 2 and 3 lost a total of one unit. That is, the increase in units of sales in the price-cutting firm is not equal to the decrease in sales in the remaining firms because the lower price brings additional demand units into the market.

Now consider the elasticity coefficients:

$$\eta_{11} = \frac{\partial x_1}{\partial p_1}\frac{p_1}{x_1} = -5, \tag{13}$$

$$\eta_{j1} = \frac{\partial x_j}{\partial p_1}\frac{p_1}{x_j} = 1, \qquad (j = 2, 3). \tag{14}$$

Thus the Bishop ratio

$$-\frac{\eta_{11}}{\eta_{j1}} = 5, \qquad (j = 2, 3) \tag{15}$$

which is not equal to $n - 1 = 2$.

It may be noted that using the new price-quantity data in the elasticity formulas does not alter the conclusion that Bishop's argument is false. Furthermore, the coefficients of the demand functions may be chosen arbitrarily and the conclusion is still maintained, although these demand functions may not satisfy the theoretical restrictions usually placed on demand functions for related goods. The necessary condition for invalidity of Bishop's case is that the total demand function not be completely inelastic.

III. AN ALTERNATIVE CLASSIFICATORY SYSTEM

In the formulation of an operationally feasible system of market classification, it seems essential to rely on objective values susceptible of empirical determination. It would be most desirable to use only easily observable quantities such as prices, numbers of competitors, etc. Yet it is well established that the use of such objective values does not afford sufficient means of classifying markets. One is immediately forced to rely on less easily observed quantities, especially demand elasticities; and, as Papandreou has shown, these coefficients are not sufficient to establish a market classification. In his view, it is necessary also to consider the abilities of the competitors to supply the output necessary to penetrate each other's markets.

[11] Harold Hotelling, "Edgeworth's Taxation Paradox and the Nature of Demand and Supply Functions," *Journal of Political Economy*, XL (1932), pp. 577–616.

We propose to go a step further and contend that to obtain a theoretically complete and satisfying system of market classification, it is necessary to introduce subjective elements, i.e., entrepreneurial expectations. If one must rely on subjective measures, operational feasibility is lost to this extent. But we believe that subjective elements are necessary *only* for theoretical completeness and that a modified Papandreou system *may* retain operational feasibility, even though finer categories are lost.

To introduce entrepreneurial expectations, we direct attention to an elasticity coefficient developed by Ragnar Frisch and called by him the coefficient of conjectural variation.[12] The coefficient of conjectural variation expresses the relative change in the price of the j-th entrepreneur that entrepreneur i *believes* he will induce by changing his (the i-th) price. Expressed symbolically, if p refers to price (or, more generally, to any parameter of action) and subscripts indicate entrepreneurs, the coefficient of conjectural variation is

$$v_{ji} = \frac{\partial p_j}{\partial p_i} \frac{p_i}{p_j}. \tag{16}$$

Theoretically, the coefficient v_{ji} can be determined either from a subjective demand function or from an anticipated reaction function. Being a subjective magnitude, it clearly lacks operational feasibility, but it does have theoretical merit.

As we have expressed the coefficient of conjectural variation, it is a price relationship, but any other parameter of action available to the entrepreneur could have been used in lieu of price or in addition to price. By "parameter of action" we mean any variable whose magnitude can be controlled independently by the entrepreneur in question. If there is more than one parameter of action, each must be independent of the others. Thus, either price or quantity, but not both simultaneously, can be a parameter of action, since if the entrepreneur establishes one of them, the market determines the other.

Price is suggested as the appropriate parameter of action for two reasons: it is the variable that the entrepreneur is most likely to manipulate in competitive efforts against rivals, and it is the variable that is observed by regulatory officials. We take these assertions as axiomatic.

In stating our system of market classification, we make use of four quantities: the coefficient of conjectural variation, elasticity of demand with respect to the good's own price, cross elasticity of demand between firms, and Papandreou's k_j (indicating the firm's ability to satisfy additional demand).

Two cases, homogeneous competition and monopoly, can be treated quickly. In the former case, it is clear that the coefficient of conjectural variation is zero because the i-th homogeneous competitor realizes that a change in his price will not affect the price of the j-th firm. Similarly, the presence of a large group of homogeneous competitors causes the cross elasticity for any two firms to be zero. Finally, k_j is zero in the case of homogeneous competition, because a firm in this situation can only supply a negligible portion of the demand units attracted by a price reduction. The only non-zero quantity is the elasticity of demand with respect to the good's own price. With the smallness of the firm, this quantity approaches infinity.

In the case of pure monopoly, there is a complete absence of interaction between firms. Thus measures of interaction cannot be defined. As a consequence, it is impossible to impute values (even zero values) to the coefficients of conjectural variation and cross elasticity. On the other hand, in conformity with orthodox monopoly theory, the elasticity with respect to the monopolist's own price is finite. Something is also known about the value of k_j if it is presumed that the monopolist is in the position of maximum profit. For at this point, he could expand output, but chooses not to do so in order to preserve his monopoly profit. That is, at the point of maximum profit, the monopolist does not produce to the limit of his capacity; accordingly, k_j is greater than zero.[13]

[12] Ragnar Frisch, "Monopole—Polypole—La Notion de Force dans l'economie," in "Festschrift til Harald Westergaard," Supplement to *National-økonomish Tidsskrift*, April, 1933. Translated in *International Economic Papers*, No. 1, 1951, pp. 23-36.

[13] It is possible that the monopolist finds maximum profits in the range of increasing average cost. If this is true, marginal cost exceeds average cost, and $\theta_j < 1$. But in these cases, $-\eta_{jj}$ while greater than zero, is likely to be small. So on bal-

Heterogeneous competition is similar to Chamberlin's now classic monopolistic competition. This situation can be identified in terms of our four coefficients, but before doing this, we recall certain points in Chamberlin's analysis.[14] Chamberlin introduces two distinct demand curves for each monopolistic competitor. One of these is the curve showing quantities demanded that accrue to the entrepreneur if all other firms in the group hold their prices constant while he varies his price. This is the highly elastic curve that Chamberlin labels *dd'*. The other curve shows the firm's demand situation if all competitors in the group vary their prices correspondingly. This reaction is depicted by his relatively inelastic *DD'* curve. As Chamberlin indicates, in this situation each firm believes that his price changes will go unnoticed by other firms, thus regarding the *dd'* curve as relevant. In other words, each firm's coefficient of conjectural variation is zero. The Chamberlin case also implies that, for each firm, the elasticity with respect to its own price is not infinity, since *dd'* is not horizontal, i.e., since price policy may be considered by the firm.

The same motivation is experienced by each firm in the group, with the result that all firms move down the relatively inelastic *DD'* curve. Although each firm expects its actions to go unnoticed because of the large number of competitors, it clearly expects to encroach on the markets of other firms, even though the loss by any one of its competitors is small. As a result, the cross elasticity of demand for any two firms is small but not zero. We denote this condition by saying that the cross elasticity coefficient approaches zero. Since each firm expects to encroach on the markets of its rivals, it must expect to produce a sufficient quantity to meet the additional demand it gains from a price decrease. Consequently, the k_j value is not zero; but since each firm is small in relation to the market, the value of k_j itself tends to be small.

Entrepreneurial expectations concerning rivals' reactions, which play no part in homogeneous competition and monopoly and which are neutral in heterogeneous competition, come clearly into the foreground in oligopoly cases. In an oligopoly situation, each firm realizes that its competitors will respond in some manner to any aggressive action that it undertakes. Accordingly, the coefficient of conjectural variation is not zero for any oligopoloid firm.

For homogeneous oligopoly, it seems reasonable to suggest that the coefficient of conjectural variation is approximately unity. In a homogeneous market, an oligopolist probably expects a rival to match his price and to meet price changes. For example, uniformity of equilibrium price is a characteristic of both the Cournot and the Edgeworth homogeneous cases. Chamberlin also favors this assumption, although he allows for price differences in transit between equilibria.[15]

If, on the other hand, product heterogeneity is present in the market, an oligopolist may not expect price changes to be met exactly by his rivals. Product differences shelter each seller's market to a degree, but ordinarily each would expect some reaction from rivals since the demands for the firms' products are interrelated. As a consequence, in this instance, we specify that the coefficient of conjectural variation is not equal to zero, but a relatively exact specification, similar to that of homogeneous oligopoly, cannot be made.[16]

In each oligopoly case, the demand elasticity with respect to the firm's own price is finite. Similarly, in each case, the cross elasticities are positive, finite values, indicating the demand relationships between the sellers' goods. Undoubtedly the cross elasticity is stronger in the homogeneous than in the heterogeneous case, but we cannot formulate this difference numerically. Finally, in each oligopoly case, it is clear that the rivals are able to supply units to encroach on the markets of others, so that the k_j values are greater than zero in each case.

The system of classification that we propose is summarized in the following arrangement:

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ance, k_j either exceeds zero or at least only approaches zero. Since the product of a monopolist has a competitive position vis-à-vis other commodities in the consumers' budgets, $k_j \to 0$ does not seem likely.

[14] E. H. Chamberlin, *The Theory of Monopolistic Competition*, 3rd ed. (Cambridge: Harvard University Press, 1939), pp. 90–1.

[15] *Ibid.*, pp. 35–6, 41–2.

[16] It is obvious that, in both homogeneous and heterogeneous oligopoly, we ignore the possibilities of the once-popular "kinked demand" hypothesis. As R. H. Coase once put it, this theory can be "checkmated in two moves."

Market type	ν_{ij}	η_{jj}	η_{ji}	k_j
Competition				
Homogeneous	$\nu_{ji} = 0$	$-\eta_{jj} \to \infty$	$\eta_{ji} = 0$	$k_j = 0$
Heterogeneous	$\nu_{ij} = 0$	$0 < -\eta_{jj} < \infty$	$\eta_{ji} \to 0$	$k_j \to 0$
Oligopoly				
Homogeneous	$\nu_{ij} \approx 1$	$0 < -\eta_{jj} < \infty$	$0 < \eta_{ji} < \infty$	$k_j > 0$
Heterogeneous	$\nu_{ij} \not\approx 0$	$0 < -\eta_{jj} < \infty$	$0 < \eta_{ji} < \infty$	$k_j > 0$
Monopoly	not defined	$0 < -\eta_{jj} < \infty$	not defined	$k_j > 0$

By reference to the summary, it may be observed that all cases can be distinguished by the coefficients that we propose. Indeed, the k_j coefficients can be omitted and all cases are still distinguishable. We have two reasons for including the k_j coefficients. First, the ability to supply units for penetration purposes is a necessary condition for all market situations except homogeneous competition. Hence to omit it is to ignore a vital condition for competitive maneuvering and monopoly pricing. Complete description requires the presence of the k_j coefficient.

Secondly, we include the k_j term since it is based on objective demand and the conditions of physical production. These quantities are measurable, and so too is the k_j factor. Thus it can replace the subjective coefficients of conjectural variation as a step toward operational feasibility of the classification. In other words, the system we propose is theoretically satisfactory; but inasmuch as it relies on the coefficient of conjectural variation, it is not operationally feasible from the viewpoint of public policy. If we omit conjectural variation from the system, we can distinguish between oligopoly and heterogeneous competition by means of the k_j coefficients. These coefficients, as indicated above, are more likely to be operationally feasible than the coefficients of conjectural variation.

It may now be noticed that if the coefficient of conjectural variation is omitted, the two oligopoly cases become indistinguishable. This is probably not a serious loss from the standpoint of public policy. Since the cross elasticity coefficient tends to be larger in the homogeneous than in the heterogeneous case, it is reasonable to believe that the two can be distinguished in a practical way by means of this measurement. It may also be noticed that if we rely on the k_j coefficients without considering conjectural variation, oligopoly and heterogeneous competition shade into one another.

The demand elasticities and the k_j values are objective quantities susceptible of being tested for refutation under ideal circumstances. This makes them operationally meaningful, but it does not necessarily make them operationally feasible. The difficulties incident to actual measurement of these values would appear to be enormous, even though these quantities are closer to operational feasibility than the coefficients of conjectural variation.

IV. CONCLUSION

In this paper we have dealt with two problems: market classification as a branch of micro-economic theory and market classification for use in public policy. The first problem requires a classification system that is operationally meaningful, while the second problem carries the more stringent need of operational feasibility.

A review of the literature of market classification convinces one that a satisfactory theoretical system cannot be constructed on the basis of demand elasticity coefficients alone. It is only if entrepreneurial expectations are brought into the system that a satisfactory theoretical structure is erected. We did this through the coefficient of conjectural variation.

The theoretical system is not satisfactory for policy questions because it relies on entrepreneurial expectations, a subjective magnitude. The system we proposed is rescued from this difficulty by the penetration concept. By use of this concept it appears possible to distinguish the oligopoloid firm from the competitive firm, if enough information is available. But the difficulties of securing and analyzing the needed information keeps our classification system from assuming full operational feasibility.

PATINKIN ON NEO-CLASSICAL MONETARY THEORY: A CRITIQUE IN WALRASIAN SPECIFICS[1]

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I. INTRODUCTION

The recent publication of Professor Don Patinkin's *Money, Interest, and Prices* may be regarded as the appearance of a summary statement of the thought of its author as it has evolved over the last decade. Together with the allied criticism of neo-classical monetary theory by Lange,[2] Patinkin's challenge to the determinateness of that body of analysis and to its successful integration with the "real goods" equations of neo-classical systems constitutes the most formidable attack ever made against it. As such it deserves to be examined in detail.

The bibliography of this controversy is already an extensive one.[3] Further contributions to it, however, will be forthcoming because of the marked evolution of views apparent between the earlier articles and the book. Patinkin's present analysis makes the categories of "right" and "wrong," provable "existence" and provable "non-existence" of the Invalid Dichotomy, in which terms much of the previous discussion took place, largely outmoded. Concomitantly, future appraisal and discussion must turn much more than past around the detailed analyses of neo-classical systems in the book.[4]

This paper, therefore, has much narrower aims than earlier critiques of Patinkin's analysis. In Section II it seeks to relate the well-known Lange criticism of neo-classical theory to the Patinkin analysis as the writer understands the latter. Section III contains a generalization of the Lange-Patinkin analysis from the specific case of money to that of any good in a general equilibrium system. Section IV uses the frameworks of Sections II and III to examine in detail Patinkin's analysis of neo-classical theory as it relates to Walras' general system. And Section V contains a brief summary and conclusion.

Much of the following will be mildly critical of Patinkin's analysis, but the writer does not wish to slight the solid contribution to the effective integration of monetary variables in a static general system made by Patinkin in the major themes of his work. Our concern will be with certain elements in the counterpoint, much of which is wholly acceptable.

II. THE INVALID DICHOTOMY

The most convenient starting point for an understanding of Patinkin's current position is Lange's analysis of neo-classical systems.[5] In this analysis (as in Patinkin's) neo-classical economies are interpreted as those in which consumers and entrepreneurs adjust their desired holdings of cash balances by changing their excess demands for goods (if, indeed, the system allows them to). Should one of these decision-making units desire to increase its balances, it does so by decreasing its demand for and/or increasing its supply of real goods. In the model, goods and cash balances are (or should be) substitutes—a point which becomes important in Section IV, since the Walrasian model does not conform to it.

Lange shows that the existence of Say's Law—or, more accurately, Say's Identity in the Becker-Baumol terminology[6]—is an effective bar to the existence of money as a medium of exchange. Such an economy is provably equivalent to a barter economy, and if an equation specifying that demand must equal supply in the money sector is added, such an equation will contradict

[1] I am indebted to colleagues W. J. Baumol, S. T. Beza, E. O. Edwards, and R. E. Quandt for reading an earlier version of this paper and giving valuable guidance.

[2] O. Lange, "Say's Law: A Restatement and Criticism," *Studies in Mathematical Economics and Econometrics* (Chicago: University of Chicago Press, 1942), pp. 49–60.

[3] The reader is referred to Patinkin, *op. cit.*, *pp.* 477–478 and 488.

[4] See, in particular, Supplementary Notes B–H, and L, as well as Chs. I–VIII.

[5] *Op. cit.*

[6] G. Becker and W. Baumol, "The Classical Monetary Theory: The Outcome of the Discussion," *Economica*, 1952, NS XIX, pp. 355–376.

the identity of demand for and supply of money which is implicit in Say's Identity.

The validity of Lange's criticism of neo-classical theorists hinges upon the acceptance by the theorist of Say's Identity. But this is not true of Patinkin's, or, rather, the latter goes beyond Lange in his criticism of the neo-classicists, including the latter's area of criticism as a sub-case of his own. Patinkin explicitly sides "with those who deny that [Say's Identity] is a basic component of the classical and neo-classical position."[7] What, then, is the "Invalid Dichotomy" present in neo-classicism if it is not the rigorous segregation of money and real sectors (to the extinction of the first) implicit in Say's Identity?

To Patinkin, the problem is that these theorists implicitly accepted the outlook that the homogeneity postulate—demand and supply equations for real goods are functions only of relative prices—was necessary to a rational economy and did not consistently relate it to their attitudes (explicit or implicit) toward Say's Identity. Therefore, they were led to assert that relative prices were determined in real goods markets and, independently, the price level was fixed in the "money market," thereby dichotomizing their models, without explicitly recognizing the interdepence necessary to avoid monetary indeterminateness. Or, less strongly, if they did not assert this dichotomy, they did not deny its possibility:

> This is the crucial point. The dynamic groping of the absolute price level toward its equilibrium value will—through the real-balance effect—react back on the commodity markets and hence on relative prices. And it is precisely the constant failure to find this point explicitly recognized—and, indeed, the constant sensation of being just on the verge of having it explicitly contradicted—that is the basis of our original contention that the roots of the invalid dichotomy are to be found in the neoclassical analyses of Walras, Fisher, Pigou, and Cassel.[8]

Patinkin's focus, therefore, is less upon the logical conditions of some rigorous model—as Lange's is, since his criticism is directed at the existence or non-existence of Say's Identity—and more upon the implications of these authors' discussions of how equilibrium is attained in real and money markets. Walras becomes an ideal case in point as a major target for Patinkin: Lange's analysis would lead us to ask the question, "Does the rigorous Walrasian model contain Say's Identity or not?" It might permit a second question: "Apart from Walras' specific assumptions, does the internal logic of Walras' system lead to a contradiction of Say's Identity, or does it not?" Although Lange did not ask these questions of Walras' analysis, they spring logically from his paper.

Patinkin's criticisms lead to some such question as the following: "Whatever the conclusion about Say's Identity as posed in the two questions above, when Walras steps outside the equilibrium conditions of his model to discuss the *tâtonnement* process by which equilibrium is reached, does he tend to dichotomize such market processes into real and monetary?"

III. A GENERALIZATION OF THE INVALID DICHOTOMY

We shall seek to answer all three of these questions for the specific case of Walras. Before we do, however, it will be valuable to generalize the Lange-Patinkin line of criticism in order to gain greater insight into the nature of a general equilibrium system.

Assume that we are describing the general equilibrium of a system with $n - 1$ real goods and money, in which all prices are measured in units of some *numéraire* outside the system. We shall begin then with n excess demand equations which are equated to zero (one of which is not independent), where excess demand is obtained by subtracting the supply function from the demand function, good by good. We shall say no more about the characteristics of the system, but we will assume that a price vector (P^0) is found whose elements fit the model.

Next, let us relax the conditions of the model sufficiently to permit us to lift the variable P_i from the system and, similarly to a government policymaker or administrator, arbitrarily increase its value to $P_i^0 + dP_i$. *If we temporarily abandon all of our preconceived notions of how well-behaved, rational, logically constructed economies should behave*, three cases will hold an interest for us:

Case 1. No excess demand in the system departs from zero, and therefore no other price in the system is affected. We shall term this the case of complete non-integration, for when a price change has no impact upon a system, in the sense of

[7] *Op. cit.*, p. 119.

[8] *Ibid.*, p. 112. The preceding paragraph draws mainly upon the analysis on pp. 107–119.

failing to impose the need for a new *tâtonnement* process, it is not truly a part of that system.

Case 2. The excess demand for the good whose price changes is affected, and departs from zero, but in such a way as to have no effect upon any other excess demand or price in the system. (Once more the reader is enjoined to suppress his Euclidean economic notions.) We shall term this the case of partial integration.

Case 3. At least one other excess demand besides that for the good whose price is disturbed departs from zero, in which case full integration of the price, P_s, is achieved.

Assume that we now assert the general impossibility of Case 2 in a rational economic model: that is, that in a system containing all possible alternatives for expenditure, any one excess demand can change without affecting at least one other. If, in spite of this general restriction, we assert that there is one good whose price does have this property, we are involved in a contradiction. Either the structure of the system does not in fact deny the possibility of Case 2 and we have a partially integrated variable, or, contrary to appearances, Case 2 must not exist and Case 1 or Case 3 must be operative. If we have structured the system specifically to prevent Case 3—taking care that the price of the good under discussion does not affect any other excess demand—then we must in fact have Case 1. That is, in spite of the appearance of affecting only its own excess demand, the logic of the system must dictate that it is completely non-integrated.

What is it in the nature of the relationships among most goods which makes of their price changes Case 3 examples? In a simple exchange economy, the *substitution* and *income effects* are the paths of interdependence that give the system coherence. Since our concern is not with the stability of the system or with gauging the strength or net direction of changes in variables, given the *existence* of a non-zero level for either or both of these effects, even should they cancel out at the end of the *tâtonnement* phase, our condition for full integration will have been met.

The essence of Say's Identity is that the inability of changes in the price of money to lead to substitution or income effects implies that the demand for and supply of it are independent of its price and identically equal.

Patinkin's Invalid Dichotomy asserts that the neo-classicals argued as if, when the price of money departed slightly from the equilibrium value, with no compensating changes in its quantity, the *excess* demand for *real* balances remained unchanged while other excess demands were undisturbed. Therefore, they implicitly treated money as a Case 1 good in real terms. As far as nominal balances are concerned, Patinkin argues, a change in the price of money was interpreted as affecting only the excess demand for nominal cash balances. But, since interdependence of the system denied this possibility, this implies that the price of money does not affect the excess demand for cash balances, so that any price level could rule. Again, money is shown to be a completely non-integrated commodity.

Lastly, Patinkin's stress on the necessity for an effect which he rechristens "the real-balance effect" is the demand that the income-substitution effect for money be built into the system so that Case 3 integration can occur.

IV. PATINKIN ON WALRAS

As a preliminary to the discussion of Patinkin's criticism of Walras, the following sketch of the latter's definitive monetary theory is presented.[9] Two specific functions of money are presented in Walras as (1) the cash balance function, allowing payments to be made as delivery contracts are fulfilled even if receipts fall short of claims, and (2) the asset function, allowing the owner of money a return for lending it to others to serve in the role of function (1). The price per unit of money *service*—that is, of "leasing" from the owners of money stocks one unit of money for use during one period of contract-fulfillment with return of the unit to its owner at the end of that period—is p_m' (using some good other than money as *numéraire*), and it is determined in a promissory note market where owners of money stocks meet demanders of cash balances as lessors confront lessees. In the budget equation of the lessor, on the income side, along with his sales of labor, land, and capital goods services, is the term denoting his earnings from his lease of

[9] Cf. L. Walras, *Elements of Pure Economics*, translated by William Jaffé (London: Royal Economic Society, 1954) Lessons 29, 30, and 31. The present writer's interpretation of this area of Walrasian theory is contained in "The Walrasian Theory of Money: An Interpretation and a Reconstruction," unpublished, of which the presentation above is a summary.

money assets, $o_m p_{m'}$.[10] One important implication of this is that in Walras money must be introduced simultaneously with borrowing and lending. No Walrasian money economy exists without "bonds" (in the present case, promissory notes).

The price of money as an asset—i.e., as a yielder of services selling for $p_{m'}$ per unit per period—is p_m (again, measured in terms of some other good). These units of money, purchased as any other asset for delivery before the *next* market day for sale of services commencing the *following* period, like any other asset, must in equilibrium sell at a price equal to the price of the service capitalized at a common rate of return ($p_{m'}/i$). The price, p_m, in Walras, however, is identically equal to this ratio.

The key to Walras' monetary theory is this duality: two functions—transactions and asset; two prices—$p_{m'}$ and p_m; two markets.[11]

Given this brief summary, let us then pose the three questions suggested in Section II. First, does Say's Identity exist in the formal Walrasian model? The answer is unmistakably "yes," although the construction of the model requires a different interpretation of the phrase. The existence of a promissory note market in the model means that economic units can adjust their holdings of cash balances to any desired level, but Say's Identity prohibited them from changing *their holdings of money as an asset at the end of the period.*

But if there is no market for cash as an asset it can have no price. And if p_m is indeterminate cash balances cannot yield any useful service, since, unlike the services of physical assets which can be priced even if the assets themselves cannot, the utility of money services depends upon money having a price. Therefore, Walras' obtaining of p_m by capitalizing $p_{m'}$ at the rate of return on physical assets is gimmickry, not economics. Money as asset is a Case 1 good in Walras. Thus, the indeterminacy is not strictly a Langean indeterminacy, but it exists.[12]

Second, does the internal logic of the Walrasian system admit of Say's Identity (in the above sense)? The author has argued elsewhere at length that the whole burden of logic in Walras requires that consumers be allowed individually to desire to change their holdings of money assets at the end of the period. He has introduced this possibility into the model by reconstructing it. With this reconstruction, money exists at a determinate price, its services are priced, and an essentially new framework is available to analyze monetary problems.[13]

But, as made clear in Section II, these two questions are used only as approaches to the third, or that which Patinkin's new analysis poses: if we have the reconstructed, formal Walrasian model referred to immediately above, so that we may abstract from Say's Identity in the manner of Patinkin, does the Walrasian discussion of the manner in which equilibrium is established in the real goods and money markets imply his acceptance of the Invalid Dichotomy?

Patinkin asserts its presence is "highly probable"[14] or, at least, if Walras did not advocate it he certainly did not oppose it.[15] We may deal quite speedily with the formal framework of Walras, for Patinkin now accepts the integration of money as a Case 3 good in the model. Suppose $p_{m'}$ and p_m rise proportionately, so that the rate of return on money, as well as all other prices, are unchanged. Then, the aggregate budget equation term, $o_m p_{m'}$, will change, and via this

[10] Patinkin interprets this term as consumers' excess supply of cash used to purchase real capital goods times the rate of interest on these goods. This is a provably incorrect interpretation: new capital goods in the Walrasian model do not begin to earn a return until the period *following* construction and purchase. The term that does represent the purchase of new fixed and circulating capital goods, $d_s p_s$, does not introduce any interest payments into the budget equation. The term $o_m p_{m'}$ must be seen as the amount earned in current income by purchasing promissory notes as a means of lending entrepreneurs (primarily) their working balances of money. See Patinkin, *op. cit.*, pp. 399–400.

[11] This interpretation is presented in the writer's "Walras, Leontief, and the Interdependence of Economic Activities," *Quarterly Journal of Economics*, 1954, LXVIII, pp. 323–354; "The Architectonics of Leon Walras," *Kyklos*, 1956, IX, pp. 241–249; "On the Existence and Role of Money in a Stationary System," *Southern Economic Journal*, July 1958, XXV, pp. 1–10; and, most intensively, in the manuscript referred to in footnote 9.

[12] These propositions are discussed at great length in the manuscript referred to in footnote 9. Space limitations prohibit their inclusion here.

[13] *Ibid.*

[14] Patinkin, *op. cit.*, p. 108.

[15] *Ibid.*, pp. 455–456.

change in income at least one other excess demand will have to change.[16] On the other hand, if only p_m were to change, direct substitution for or against goods and securities (from the capital goods market) would occur in addition to the change in the budget equation term. Ergo, in the Walrasian system, reconstructed to eliminate Say's Identity, money is a Case 3 good.

Thus, in spite of Patinkin's assertion that the "real-balance effect" must enter at least one equation in order to yield a determinate price level, the Walrasian system obtains this result without linking the absorption of goods to the value of a stock of money wealth. Rather, the real value of an *income flow*—the earnings on money lent as working capital—provides the non-homogeneity required. Therefore, Patinkin's criticism of the absence of the real-balance effect is not relevant.[17]

But the main burden of Patinkin's present criticism has moved to Walras' discussion of the *tâtonnement* process. The primary basis for this criticism is the following passage from Walras which we must quote at some length:

> On referring back to the various terms that enter into the composition of (the value of inventories demanded in money form), we perceive that they are not absolutely independent of $p_{m'}$, since $p_{m'}$ figures in the term $o_m p_{m'}$ of the (budget constraint), which together with the equations of maximum satisfaction, enables us to deduce the quantities (of inventories desired in money form) for any one party to the exchange, and, consequently, the aggregate quantities (of such services) for all parties together. We must admit, however, that the dependence of these items on $p_{m'}$ is very indirect and very weak. That being the case, the equation of monetary circulation, when money is not a commodity, comes very close, in reality, to falling outside the system of equations of economic equilibrium.
>
> If we first suppose economic equilibrium to be established, then the equation of monetary circulation would be solved almost without any *tâtonnements*, simply by raising or lowering $p_{m'}$ according (as demand for money differed from supply), at a price $p'_{m'}$ which had been cried at random. If however, this increase or decrease in $p_{m'}$ were to change (the value of inventory services desired in money form) ever so slightly, it would only be necessary to continue the general process of adjustment by *tâtonnements* in order to be sure of reaching equilibrium. That is what actually takes place in the money market.[18]

After quoting this passage at somewhat greater length, Patinkin comments:

> This is the sum total of Walras' discussion of the *tâtonnement* by which the level of $p_{m'}$ and hence p_m is determined. It shows that Walras is quite willing to assume that, with $p_{m'}$ arbitrarily fixed at the level $p'_{m'}$, a *tâtonnement* in the commodity markets first achieves equilibrium there; that, once this is accomplished, a *tâtonnement* in the money market then determines the equilibrium level of $p_{m'}$; *and that this latter tâtonnement can be carried out without reacting back and disturbing the equilibrium initially achieved in the commodity markets.* It fails to indicate any realization on the part of Walras that such a dichotomization of the pricing process contradicts the very conditions necessary for the existence of a monetary economy.[19]

The present author asserts merely that other evidence exists which tends to soften the impact of Patinkin's charges. First, the last sentence in his comment flies in the face of the statement by Walras above that the lack of strength of the dependence comes close to excluding the monetary equation from the system. Second, the longer passage quoted by Patinkin contains a statement that only if the demand for and supply of money balances were brought into equality could the demand for and supply of the *numéraire* good be equated (given equilibrium in all other markets). The required linkage to the real goods sector is here explicitly recognized.

Third, Patinkin's charge that Walras did not bother to trace out the reactions back upon the real sector's prices of the *tâtonnements* in $p_{m'}$ is true, but he does recognize that the "feedback" case is what actually occurs in the market. Moreover, by this time, he had expressly dealt with the feedback in the multiple exchange economy, the production economy, and the

[16] For Patinkin's recognition of this, see *op. cit.*, pp. 403–404. See also the writer's "Walras, etc.," *loc. cit.*, pp. 335–336. The element of non-homogeneity upon which the price level is hung is this term in the budget equation. Patinkin states that the writer failed to see this as the real issue, but the reference cited will indicate that this was exactly his point.

[17] Patinkin, *op. cit.*, p. 411.

[18] L. Walras, *op. cit.*, pp. 326–327, with minor changes.

[19] Patinkin, *op. cit.*, pp. 402–403.

capital goods economy, so that he might reasonably have felt it was unnecessary to repeat it. For example, on page 329 he refers to the price of inventory services as being determined by one equation (excess demand for them equal to zero)—in the midst of his treatment of money—yet it would be difficult to infer that he consistently envisions them as Case 2 goods.

Lastly, Patinkin himself quotes Walras' tracing of the impact of an increase in commodity money upon prices, in which the latter shows (imperfectly, as Patinkin points out) how reactions throughout the price system result in a final neutral effect upon the interest rate.[20]

[20] *Ibid.*, p. 406, and Walras, *op. cit.*, p. 406.

These arguments seem rather stiff evidence against the dominant presence of the Invalid Dichotomy in Walras. At the least they serve to temper the indictment of Patinkin.

V. CONCLUSION

The present writer concludes that Walrasian monetary theory—and, to the extent he typifies it, neoclassical theory as well—is more subject to the Lange criticisms than to the broader challenge of Patinkin, although, as indicated above, even the former must be modified for Walras. At the same time, however, Patinkin's present attack is a more sophisticated one than Lange's, and therefore less susceptible to "proof" or "disproof" in some final sense.

TECHNOLOGICAL CHANGE IN THE TEXTILE INDUSTRY[1]

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INTRODUCTION

The question of how technological change can be measured led to the empirical study of a segment of the textile industry described below. A technique developed for comparing costs of production over a period of several years was applied to six textile mills. The conclusion reached from this study was that productivity had increased by an average amount of 1.6 per cent a year. This percentage change is less than the increase experienced by the aggregate of manufacturers in the United States, and the increment was found to be consistent with other measures of productivity changes in the textile industry.

The literature of economic change reflects considerable ambiguity in the usage of the terms: innovation, productivity change, and technological change. Not only are the terms sometimes used interchangeably which does little to promote clarity, but when distinctions are made they are seldom made in accord with fact. Though these difficulties are not surprising in view of the nature of the phenomena described, nevertheless they present the empirical investigator with the added problem of setting up a working definition. For example, one distinction that frequently occurs equates innovations with changes in production functions on the one hand and productivity changes with improvements in the quality of productive factors on the other hand. But if we accept the fact that advances in efficiency result from simultaneous and interdependent changes in the characteristics and combinations of resources, particularly of capital resources, then this distinction becomes more artificial than real. Consequently, for the purposes of our investigation, we propose to use the term "technological change" to include both shifts in the production function and improvements in the quality of capital resources but to exclude changes in the quality of labor.

This investigation of technological change in the textile industry is limited to a small number of observations made of actual firms. As a result, the conclusions drawn from the investigation are less general than could be hoped for, but are nevertheless suggestive for the entire textile industry. The data support an estimate of the annual rate of technological change of 1.6 per cent from 1949 to 1955, a rate well below the long term average for most industries.

With the exception of an additional adjustment for variations in the utilization of plant capacity, the procedure used for measuring technological change is the same as the procedure employed by other investigators to measure total factor productivity.[2] Some troublesome variables were avoided by selecting the sample of firms from the segment of the textile industry that produces cotton sheeting and print cloth. These are the two staple products of the industry, and the mills that produce them often have a long-uninterrupted history of producing a homogeneous cloth product. Restricting the investigation to firms producing standard products avoided the need for adjustments in the measure of output that would have been re-

[1] The authors wish to acknowledge their indebtedness to the National Science Foundation and the Division of Research of the School of Textiles of North Carolina State College for support given to this project. Grateful appreciation is also due to the many who provided counsel and assistance including Clark Lee Allen, Solomon Fabricant, Earl O. Heady, George Morton, and William A. Newell. Without the information furnished by the officers of the unnamed firms there would have been no study.

[2] For example, see John W. Kendrick, *Productivity Trends: Capital and Labor*, National Bureau of Economic Research, Occasional Paper 53 (Princeton: Princeton University Press, 1956).

quired if the characteristics of output, or product-mix, varied through the period studied. This limitation of output groups does not fully solve the problem of expressing output in comparable units over time, but it does minimize errors on this account. Further, producers of staple commodities are less likely to experience variations in the rates of change of output than producers of fancy or quality products.

All six mills studied are in North Carolina and South Carolina and together they produce a little more than one per cent of all domestic, broadwoven, cotton goods, and nearly four per cent of all bleached and white finished cottons. These mills may have undergone a degree of technical change somewhat greater than other mills of the industry producing the same commodities. Despite reassurance that individual mills could not be identified in the published results of the study, some mill managers chose not to cooperate in this investigation. It is not unlikely that some of the managers refused to avoid risk of a bad showing because they had made few alterations in methods or changes in equipment in recent years. It is even more likely that the main deterrent to participation was the revelation of confidential cost data, a factor that may have been either constant or randomly distributed among companies. Firms producing other cotton fabrics may be expected to show both greater and lesser degrees of change than those producing sheeting and print cloth, depending in some degree on whether the commodities are of finer or of inferior quality. Discussions with textile producers indicated that there was a tendency for fewer changes to be made in the mills producing lower quality fabrics.

PROCEDURE AND FINDINGS

The method used in this study is a straightforward comparison of real costs in two years. There are five elements other than technological change that affect unit costs. They are: (a) changes in the continuity of output; (b) fluctuations in the rate of output; (c) changes in scale of plant; (d) changes in quality of factors other than fixed capital; and (e) general and relative price changes for factors.

The four influences on unit costs that are the most difficult to remove are the effects of scale of operation, degrees of utilization of plant, changes in the quality of labor, and changes in relative prices of factors. General price changes are readily removed by appropriate price deflators. The problem of scale is often avoided by the assumption of long run constant costs or its equivalent, a production function homogeneous to degree one. Although such an assumption, which is also used here, may seriously distort measurements extending over long periods it is unlikely to bias short term results.

The second influence on unit costs is variation in unit output. Some understanding of the effect of variation in rate of output may be seen in the scatter diagram in Figure 1 showing the variation of total unit costs with output for each mill in every quarter of 1949.[3]

The regression equation for the data used in the construction of Figure 1 is: $y = 127 - .27x$, where x is output expressed as a percentage of average quarterly output by mills in 1949, and total unit costs, y, is expressed as a percentage of average annual unit cost in mill. The data withstood a test of curvature; to depart significantly from a linear regression with seven and seven degrees of freedom, F must be 3.79 or greater, and in this case $F = 1.12$.

Tests were made of the closeness of fit for similar equations relating the various classes of cost to output. Those for cotton, labor, and power reveal significance at the one per cent level, and the remaining equation for all other costs was significant at the five per cent level. Although the equations are statistically significant, their economic significance must be established on other grounds. For example, if general economic conditions caused each firm to operate at an output below maximum efficiency, the results obtained would be consistent with a U-shaped curve. There is good reason to believe that such a condition existed, for it is likely that all firms were affected by the July, 1949, trough of the cycle in cotton textiles.[4]

Production of the six mills was compared for the years 1949 and 1955, with two exceptions. The need for adjustments for fluctuations in the rate of output is emphasized by the comparison of the two years in different phases of the industry cycle. The year 1949 was the trough of one cycle and 1955 was a year of cyclical ex-

[3] The lag of costs behind output in the recording of data is about two weeks.

[4] T. M. Stanback, "The Textile Cycle: Characteristics and Contributing Factors," *The Southern Economic Journal*, October 1958, XXV, p. 175.

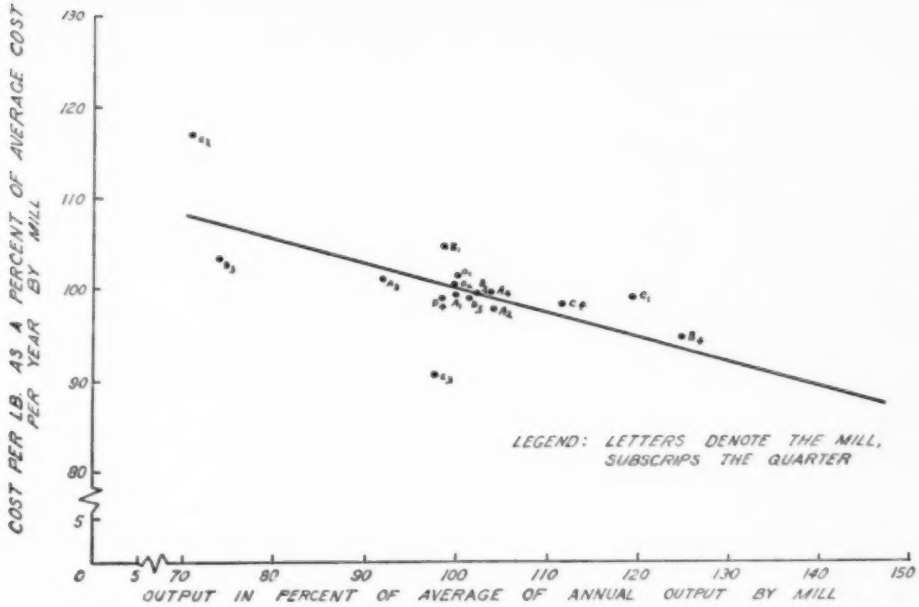

FIG. 1. VARIATIONS IN UNIT COSTS IN RELATION TO VARIATIONS IN THE RATE OF OUTPUT FOR SIX TEXTILE MILLS IN 1949.

pansion.[5] The actual variations in quantities of real output for the mills are shown in Table 1.

Clearly the relevant comparison is that of the last column, but since this figure may also reflect differences in scale the variations by quarter suggest the extent of fluctuation in utilization of capacity. Mills B and C increased their capacity between the years by about one-fifth and one-half respectively.

Base year output in Table 2 is adjusted to express the same ratio of output to plant and equipment that prevailed in terminal year. The adjustments for cost are made on the basis of the regression equation. This adjustment is made to answer the question: what would have been the unit costs if output in 1949 relative to the stock of plant and equipment then in place, had been the same as the ratio of output to plant and equipment that existed in 1955? These unit costs, in 1955 prices, are then compared to actual 1955 costs for a measure of technological change that excludes the effect of changes in utilization of capacity.

The actual terminal year unit costs and the average yearly percentage reductions attributable to technical change are shown in Table 3. The unweighted averages of the unadjusted and adjusted reductions in unit costs are the same, 1.6 per cent annually.[6]

The third problem, that of removing effects of quality changes in factors other than fixed capital, was solved by adjusting for quality changes in the labor input. When quality changes occur in managerial ability they would appear as changes in the production function and accordingly would be accounted for as technical changes. Further, there are virtually no difficulties in comparing raw cotton fiber and electric power in the two years. There is some possibility of changes in the quality of cotton, but these are known in each instance and appeared to be unimportant.

[5] *Ibid.*

[6] The equality of adjusted and unadjusted percentage reductions would necessarily be the same if adjustment had been made on the basis of deviations of each firm's base year output from the average output of all firms taken together. Otherwise there is no such necessity and the equality obtained is a matter of chance.

TABLE 1

INDEXES OF OUTPUT IN 1949 AND 1955 FOR SIX TEXTILE MILLS[a]

	1949 (1st Qtr. = 100)				1955 (1st Qtr. = 100)				Total 1955 as a per cent of Total 1949
	Quarter				Quarter				
	1	2	3	4	1	2	3	4	
Mill A	100.0	102.6	94.0	104.4	100.0	101.9	94.4	97.2	83
Mill B	100.0	103.5	75.0	126.5	100.0	99.3	57.9	96.7	139
Mill C_1, C_2, C_3	100.0	59.0	81.9	93.6	100.0	92.9	91.5	91.3	89
Mill D	100.0	99.7	101.4	98.2	100.0	94.7	94.3	86.2	132

[a] Indexes are uncorrected for differences in number of weeks per quarter as reported by mills. Mills C_1, C_2, C_3 are treated as one. For Company D the years compared are 1950 and 1956.

TABLE 2

BASE YEAR OUTPUT AND UNIT COSTS ADJUSTED TO THE RATIO OF PLANT AND EQUIPMENT TO OUTPUT PREVAILING IN THE TERMINAL YEAR (IN 1955 PRICES)

Mill	Base year		Adjusted	
	Output (Mil. lb)	Unit Costs (¢/lb)	Output (Mil. lb)	Unit Costs (¢/lb)
A	13.4	72.4	11.7	75.0
B	21.9	80.3	25.3	76.9
C_1, C_2, C_3	47.4	78.3	47.2	78.4
D	43.1	84.3	41.9	85.0

TABLE 3

TERMINAL YEAR COSTS AND AVERAGE YEARLY REDUCTIONS (1955 PRICES)

Mill	Unit Costs (¢/lb)	Number of Years	Average Yearly Reduction (%)	
			Unadjusted	*Adjusted*
A	67.6	6	1.1	1.6
B	72.7	6	1.6	.9
C_1, C_2, C_3	71.2	6	1.5	1.5
D	74.9	5	2.2	2.4

The raw data supplied by the mills included the money payments to labor in the two years, the numbers of employees in each job category, and the wage rates paid to each job classification. A wage-price index that merely expresses the percentage change in wage-rates per man was inadequate to reduce the monetary wage bill to a reflection of identical labor units in both years. It was obvious from the data that a shift in the quality of labor hired occurred between 1949 and 1955, appearing as an increase in the proportion of employees with more highly rated skills. Not only had the distribution of labor in job classes been changed, but wage rates of the several classes had changed in different ratios.

To incorporate all of the changes in the labor forces into one deflator an index was constructed that incorporated changes in distribution as well as in rates of payment. This was done in the following way: Let s stand for skilled labor in the initial year and S for skilled labor in the terminal year; and, similarly ss and SS for semiskilled in the first and terminal years; u and U for unskilled labor; L for the quantity of labor in man-weeks; and W for hourly wage. The index for expressing the 1949 labor input in 1955 prices and in comparable units would be:

$$\frac{L_sW_S + L_{ss}W_{SS} + L_uW_U}{L_sW_s + S_{ss}W_{ss} + L_uW_u} = \text{Index of Labor Costs.}$$

An implicit assumption in this index is that job specifications were unchanged in the two years, and assurances were received that this was the case. Relative wage rates between classes may differ because: (a) supply conditions change, (b) changes occur in the rate of output that may require different combinations of skill classes, and (c) production techniques may change. The adjustment for qualitative changes in the labor input is not wholly independent of the process of change since the weights used to combine the several skills into a homogeneous unit is partially

affected by the technical change being measured. A particular change in techniques would need to be widespread to cause a significant change in the demand for the various skills. If a change of the production function is of the kind initiated internally by management rather than by a dramatic development from without, such a condition is not likely to be satisfied and this interdependence can safely be ignored.

Hourly wage rates rather than weekly wages or earnings were used in constructing the indexes in Table 4 for two reasons. The hourly data were more readily available, and were in a form that allowed classification by skills. If there had been a variation in the amount of overtime worked by the several classes or by the entire labor force in the two years the index of hourly earnings would have been correct. A comparison of observed wage bills for the two years with the wage payments implied by the independently derived, weighted, wage indexes yielded almost identical quantities. From this result it is evident that the amount of overtime in both years was not significantly different.

The indexes of Table 4 multiplied by the number of workers employed in 1949 gives a wage bill that would have been incurred in 1955 had these same workers, taking into account their enhanced abilities, been employed in 1955. This procedure was used to compute the unit costs, in 1955 prices, as shown in Table 2.

These indexes compared to an index based simply on average hourly rates for the two years, weighted by the quantity of labor in each year by class, would tend to show the extent of upgrading of labor, or quality improvement of input. Indexes of average hourly earnings are as shown in Table 5.

Comparison of these indexes with those in Table 4 indicate that the degree of quality improvement is about 2 per cent.

The fourth major factor impeding isolation of technical change is the effect of changes in the relative prices of productive factors. In the statistical cost function and the full input-output or total productivity approaches, factor prices have usually been expressed at base period levels. This procedure manifestly leads to an overstatement of costs in every period except the base period.[7]

TABLE 4

WAGE INDEX AS CORRECTED FOR QUALITY IMPROVEMENTS OF LABOR

	1949	1955	1956
Mill A	100.0	113.8	
Mill B	100.0	110.4	
Mills C_1, C_2, C_3	100.0	125.0	
Mill D[a]	100.0		117.2

[a] For Mill D a census of job descriptions and wage rates was obtainable only for 1949, cost data and output for 1950. Wage-hour data were declared to be identical for the two years 1949 and 1950.

TABLE 5

INDEX OF AVERAGE HOURLY EARNINGS 1949, 1955, 1956 (1949 = 100)

	1949	1955	1956
Mill A	100.0	116.5	
Mill B	100.0	111.6	
Mill C_1, C_2, C_3	100.0	124.1	
Mill D[a]	100.0		122.9

[a] See Note to Table 4.

TABLE 6

PRICE CHANGES OF STANDARD ITEMS OF TEXTILE EQUIPMENT SELECT YEARS, 1951 (BASE YEAR = 100) TO 1956[a]

Year	Revolving Flat Card, "40L, Whitin	X_3, "46 Loom Draper	Unweighted Average of Eight Pieces of Whitin Equipment
1951		100.0	
1952	100.0		100.0
1955		106.2	
1956	110.0	112.4	119.2

[a] Information supplied by Draper and Whitin Corporations.

Before discussing the procedure used to cope with changes in relative factor prices, and in order to complete accounting for costs, it is necessary to consider measurement of the capital input. There are two issues involved: (1) price movements, and (2) estimation of magnitude.

[7] H. Staehle, "The Measurement of Statistical Cost Functions," American Economic Association, *Readings in Price Theory* (Homewood, Ill.: Richard Irwin, 1952), p. 274.

TABLE 7

COSTS BY CATEGORY IN 1955 PRICES AND OUTPUT FOR SIX MILLS, QUARTERLY FOR TWO YEARS.
(Amounts are in thousands)

	Labor	Capital	Cotton	All Other	Total	Output (in lb.)	Cost per lb. (cents)
Mill A							
1949							
1Q	$672	$174	$1,367	$200	$2,413	3,342	72.2
2Q	679	190	1,402	206	2,477	3,479	71.2
3Q	624	177	1,265	203	2,269	3,078	73.7
4Q	694	195	1,422	209	2,520	3,475	72.5
Total	$2,669	$736	$5,456	$818	$9,679	13,374	72.4
1955							
1Q	$508	$144	$1,183	$201	$2,036	2,969	68.6
2Q	521	141	1,213	199	2,074	3,074	67.5
3Q	473	139	1,112	197	1,921	2,817	68.2
4Q	508	141	1,130	199	1,978	2,983	66.3
Total	$2,010	$565	$4,638	$796	$8,009	11,843	67.6
Mill B							
1949							
1Q	$1,593	$242	$2,199	$514	$4,548	5,409	84.1
2Q	1,474	247	2,236	523	4,480	5,597	80.0
3Q	1,108	228	1,527	496	3,359	4,052	82.9
4Q	1,837	259	2,557	539	5,192	6,841	75.9
Total	$6,012	$976	$8,519	$2,072	$17,579	21,899	80.3
1955							
1Q	$1,727	$315	$3,305	$707	$6,054	8,590	70.5
2Q	1,733	312	3,172	704	5,921	8,531	69.4
3Q	1,261	280	1,901	658	4,100	4,973	82.4
4Q	1,873	315	3,133	706	6,027	8,306	72.6
Total	$6,594	$1,222	$11,511	$2,775	$22,102	30,400	72.7
Mills C_1, C_2, and C_3							
1949							
1Q	$3,543	$765	$5,791	$888	$10,987	14,163	77.6
2Q	2,394	631	3,828	837	7,690	8,407	91.5
3Q	3,008	629	3,745	878	8,260	11,594	71.2
4Q	3,497	626	5,168	898	10,189	13,252	76.9
Total	$12,442	$2,651	$18,532	$3,501	$37,126	47,416	78.3
10/54–9/55							
1Q	$3,312	$1,026	$6,021	$968	$11,327	15,747	71.9
2Q	3,299	1,102	5,870	964	11,235	15,684	71.6
3Q	3,291	968	5,246	965	10,470	14,340	73.0
4Q	3,272	1,051	6,100	963	11,386	16,632	68.5
Total	$13,174	$4,147	$23,237	$3,860	$44,418	62,403	71.2

TABLE 7 *Continued*

	Labor	Capital	Cotton	All Other	Total	Output (in lb.)	Cost per lb. (cents)
			Mill D				
9/50–8/51							
1Q	$3,672	$656	$4,166	$720	$9,214	10,791	85.4
2Q	3,596	645	4,132	764	9,137	10,761	84.9
3Q	3,500	660	4,197	768	9,125	10,947	83.4
4Q	3,363	656	4,091	726	8,836	10,601	83.4
Total	$14,131	$2,617	$16,586	$2,978	$36,312	43,100	84.3
10/55–9/56							
1Q	$2,602	$657	$4,235	$795	$8,289	11,491	72.1
2Q	2,523	690	4,078	790	8,081	10,676	75.7
3Q	2,540	726	4,068	795	8,129	10,511	77.3
4Q	2,343	669	4,024	792	7,828	10,492	74.6
Total	$10,008	$2,742	$16,405	$3,172	$32,327	43,170	74.9

If there were only one basic unit of equipment with deterioration characteristics of the one-horse shay, the magnitude of capital could be expressed either in physical or monetary units. If expressed in monetary units a pure deflator for price changes would be required to give the same comparison as would be given by the physical measurement. To approximate this ideal the stock of capital equipment in 1949 is revalued to assign to it the worth it would have had, had it been purchased in 1955 in its condition of the earlier year. To compare this figure to the actual amount of equipment in 1955, the latter is also expressed in 1955 prices. The best data available for such a price index are prices of models of textile equipment which have undergone little or no change between the two years compared. Some of these are shown in Table 6.

Properly weighted, such individual prices yield a price index of textile equipment as follows:

1949	85.6
1951	100.0
1955	104.0
1956	110.2

These indexes are appropriate for valuing similar stocks of capital in the prices of a single year given consistent base year appraisals. Some of the firms had valued their equipment in the prices of a single year. Use of these calculations greatly facilitated base year appraisals. If such calculations had not been made, data were obtained for the characteristics of equipment specifying the date of construction and brand name, for major items of equipment so that an appraisal consistent with equipment in other mills could be made. As in any capital stock estimate there are deficiencies in this procedure, such as the assumption of similar physical conditions for every piece of equipment of a specified year and model. Nevertheless, these estimates are clearly superior to net or gross book values or even to used equipment estimates which were also available.[8]

To continue with this accounting for costs, some portion of capital values must be attributed as costs of the output for each quarter or unit of output. Theoretically, these costs are the returns to fixed capital determined as the residuum and need not be proportional to the amounts sunk at any time. They are treated here, however, as though they were a linear function of time only.

Expenditures for repair and alteration or improvement of the basic equipment also may be considered as capital costs. Expenditures for repair items, however, are not necessarily made at the time of consumption, they are more likely made when stocking the supply room.

[8] Estimates of resale value were kindly provided by Ben Davis of Charlotte, North Carolina.

Repair expenses were judged to be proportional to usage, or wear and tear. For this reason outlays for repairs are allocated among quarters, not as reported for accounting purposes, but in proportion to consumption of electric power. With expenditures for repairs included in capital costs, the major categories of cost are shown in Table 7.

All expenditures for factors have been expressed in 1955 prices. In the first, or base year the cost per pound of cloth ranged from a quarterly low of 71.2 cents in Mills A and C, to a high of 91.5 cents in Mill C in the second quarter. The second highest was 85.4 cents per pound in Mill D. In the later year, cost per pound ranged from 66.3 cents in Mill A to 82.4 cents in Mill B. The next high was 77.3 cents per pound in Mill D. These data have already been summarized in Table 2. There it was shown that, when adjusted for variations in the degree of capacity utilization, the average annual rate of technological change was 1.6 per cent. If allowance is made for changes in relative factor prices this conclusion is not changed.

A comparison of the various price indexes in Table 8 shows some change in the relationship between prices of the inputs. The change in relative prices would seem sufficient to cause some substitution among factors. The greatest variation in price movement, the price of cotton from Mill D, was the result of a single purchase. This occurrence would not have affected managerial decisions about factor combinations since general market trends were in the opposite direction.

To determine whether the relative factor price changes were important, inputs are weighted by 1949 prices rather than 1955 prices. The resulting estimates of technological change are shown in Table 9. These estimates average 1.6 annually, the same as the estimates based on 1955 prices.

When factors are expressed in 1949 prices, the resulting measure of technological change tends to set a lower limit for the actual change; just as an upper limit is approximated by expression in 1955 prices, as in Table 8 above. The rationale is straightforward. If relative factor prices have changed, and actual quantities of inputs employed in both years are valued in 1949 prices as in a Laspeyre's Index, terminal years' costs would be overstated. Theoretically, the entrepreneur would have used different proportions of inputs in 1955 than those observed because relative factor prices in 1949 differ from those which influenced his decisions. As a result, he would have succeeded in reducing costs in 1955 below the levels computed and technical progress would be greater than measured. The opposite would be true when both years' inputs are expressed in 1955 prices as in a Paasche index. Had relative factor prices been the same in 1949 as in 1955, the entrepreneur would have combined his resources in different proportions than those observed in 1949, and costs would have been lower than those computed. Technical change would therefore be less than estimated. This conclusion is inescapable for the case of neutral technical change, that is, for changes which do not affect marginal rates of substitution among factors. In the event of technical change which affects marginal rates of substitution valuation of factors in their base year prices continues to set the lower limit of change, but terminal year pricing does not set the upper limit.[9]

TABLE 8

PRICE CHANGES FOR COTTON, LABOR, AND CAPITAL IN TERMINAL YEAR AS A PER CENT OF BASE YEAR FOR SIX MILLS

Mill	Cotton	Labor	Repairs	Capital equipment
A	110.5	113.8	127.6	104.0
B	113.8	110.4	127.6	104.0
C_1, C_2, C_3	119.3	125.0	125.1	104.0
D	88.2	117.2	126.1	110.2

TABLE 9

UNIT COSTS FOR SIX TEXTILE MILLS IN 1949 PRICES, UNADJUSTED FOR CHANGES IN RATE OUTPUT

Mill	Base Year Unit Costs		Terminal Year Unit Costs (¢/lb)	Average Yearly Reduction	
	Unadjusted (¢/lb)	Adjusted (¢/lb)		Adjusted (¢/lb)	Adjusted (%)
A	64.5	66.8	60.6	1.0	1.8
B	71.1	68.1	64.3	1.6	.9
C_1, C_2, C_3	64.6	64.7	59.4	1.3	1.4
D	74.1	74.7	66.6	2.0	2.4

[9] V. W. Ruttan, *Technological Progress in the Meatpacking Industry, 1919–1947*, U. S. Department of Agriculture, Marketing Research Report No. 59 (January, 1954), pp. 15–20.

An alternative procedure of correcting for relative price changes of productive factors, and at the same time, of correcting for changes in the degree of capacity utilization is the use of a statistical production function. Although this procedure has the advantage of simplicity, the requirement of large quantities of data is an overwhelming disadvantage in this instance. Quarterly observations for the six mills were apparently insufficient for even a two factor production function.[10]

CONCLUSIONS

To the extent the mills included in the study are representative of the textile industry, the derived estimate of technical change can be generalized. The possibility of generalization is supported by a comparison of the results of this analysis with productivity changes of yards per man-hour in the basic textile industry including producers of cloth from all fibers. The comparison is expressed in simple, unweighted, annual averages of percentage change. Increases in labor productivity in the six mills from 1949 to 1955 were: 2.9, 4.4, 4.1, and 8.3 respectively from Mills A, B, C, and D. The average of these changes was 4.9 to compare with a change of 31.3 over the same period for the whole industry, an annual average of 5.2 per cent.[11]

For the private domestic economy John Kendrick estimates that total factor productivity, a measure somewhat similar to the measure of technical change above, has increased by 1.7 per cent per year for the long period, 1899 to 1953. The unweighted average rate of increase for 33 industry groups has been 2.3 per cent for the same period. For the years 1919 to 1953, the respective rates were 2.2 and 2.9 per cent.[12]

In conclusion, the degree of technical change experienced by the six textile firms studied, and probably by the entire basic textile industry, has not been as great as the long term rate of change in other industries. Reasons for the disparity are probably due to such diverse causes as the low income elasticity of demand for textile products and the market conditions of the textile machinery manufacturers. The characteristics of the textile machinery market appear to be those of an oligopoly. An oligopolistic market for capital equipment would suggest that research and development would be directed toward minor modifications rather than radical new designs.[13] This, in turn, would at least partially explain the slight degree of technological change experienced in the textile industry.

[10] Production functions of the Cobb-Douglas form were derived for each mill from quarterly capital costs, C, defined as "user costs" and including repairs only; quarterly constant dollar expenditures on labor, L; and quarterly output, Q, in pounds. The exponents b_1, and b_2 of the functions of the general form $aL^{b_1}C^{b_2}$, for both years are as follows:

Firm	1949		1955	
	b_1	b_2	b_1	b_2
A	1.1134	.0806	−.9608	−.2039
B	.3212	.8936	−.6708	2.1446
C_1, C_2, C_3	1.2528	.0844	−3.8060	.5020
D	.2127	.3178	.7142	−.3792
Combined	.8458	−.0412	.6610	.1730

The combined function for 1955 takes on a familiar shape, but as an aggregate it obscures the unacceptable nature of the individual functions on which it is based. Nevertheless, use of this aggregate function to correct for changes in factor proportions yielded an estimate for technical change of 1.25 per cent annually.

[11] Estimates of the Textile Workers Union of America, Solomon Barkin, Director of Research.

[12] J. W. Kendrick, *Productivity Trends, op. cit.*, Tables 1 and 3.

[13] W. H. Brown, "Innovation in the Machine Tool Industry," *Quarterly Journal of Economics*, August 1957, LXXI, Pp. 406–425.

LONG RUN PROSPECTS OF SOUTHERN AGRICULTURE*

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Depending on one's purpose, the term "Southern Agriculture" may signify different geographic areas. As used in this paper the Old Cotton South, includes eight States—the Carolinas, Alabama, Georgia, Tennessee, Mississippi, Arkansas, and Louisiana. This is not a homogeneous area. Had data permitted, the Old South would have been delineated along more homogeneous lines. But the region selected does have common problems, and it is from this standpoint that the long-term prospects of its agriculture are considered.

This consideration is guided by the economic concept of an ideally organized society in which productive services are so apportioned among employments that similar services receive equal rates of returns. Inequalities of returns thus become indicators of potential improvements that might be achieved through reapportionment of services among different sectors of the economy. This does not mean that an ideally efficient economy, in the sense of complete equality of monetary returns, is a desirable goal, as other purposes may be prized more highly. However, it is assumed that a situation is not desirable in which income in farming is half or less than that of nonfarm employment.

Five questions fix our problem: (1) What is the present position of the Old South with respect to the amount and composition of farm output, pattern of resource use, and income? (2) What economic factors are effecting long-term changes in this position? (3) What kind of agriculture may unfold from these changes? (4) Within the visible future, say approximately the next 20 years, are there good grounds for expecting a substantial rise in the income level of the agriculture of the Old South? (5) Can we expect a substantial narrowing of the income gap (a) between farm and nonfarm employment, and (b) between farming in the Old South and other segments of the economy?

I

The following observations provide a thumbnail sketch of the present position of agriculture in the Old South: (1) In 1954, this region included more than a fourth of all commercial farms of the Nation, but it had less than a tenth of the value of farm real estate, and accounted for only about an eighth of all commercial farm output.[3]

(2) More than 70 per cent of its farm sales was accounted for by crops and the rest by livestock. These proportions were substantially the same for the Delta States as for the rest of the Old South. More than 50 per cent of the total crop income was from cotton and tobacco.[4]

(3) More than two-fifths of all land in farms is in woods; about a third is in crops; and a tenth is in pasture. Approximately 20 percent of all cropland is in cotton and tobacco. In 1957, the strictly delta portions of the Old South accounted for more than half its total cotton output of 4.3 million bales.

(4) More than 84 percent of all commercial

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* The opinions expressed in this paper are those of the author and do not necessarily represent the views of the Farm Economics Research Division, Agricultural Research Service, or the United States Department of Agriculture.

[1] This paper was presented at the annual meeting of the Southern Economic Association at Atlanta, Georgia, November 21, 1958. The author is indebted to his co-worker, Harold E. Barnhill, for substantial assistance, especially in developing data for the paper.

Some eleven tables and eight charts were developed in the preparation of this paper but omitted here because of limited space. However, they may be made available to anyone requesting them from the author. In this paper, documentation is handled simply by references to sources from which tabular and graphic presentations were developed. The data are familiar to most readers but their organization into the Old South and the rest of the United States involves burdensome computations.

[3] Derived from data in *United States Census of Agriculture*, 1954, Vol. 2, General Report.

[4] Derived from data in *United States Census of Agriculture*, 1940, 1950, and 1954, Vol. 2, Ch. IV. All values adjusted to 1954 dollars.

units in the Old South had sales of less than $5,000 in 1954 as compared with 53 percent in the rest of the United States. Such low-production farms are disappearing rather rapidly in all sections of the country, but the rate of disappearance is not strikingly faster in the Old South, where they are most heavily concentrated.[4]

(5) With respect to income, two facts stand out: In 1950, the latest year for which data are available, the median income of all families in the Old South was only 59 percent as high as that of the rest of the country—$1,639 as compared with $2,793. Again, the median income of farm families in this region was only 43 percent of that of nonfarm families, whereas the comparable figure for the United States was 53 percent.[5] As is generally recognized, to narrow these wide gaps in income between the Old South and other sectors of the economy, one or both of two things are needed. Either (1) industry must develop at a faster rate in the Old South than elsewhere, or (2) the rate of net outmigration must be speeded up.

II

Attention is now directed to factors that are affecting long-term changes in this agricultural structure. These factors may be grouped into two categories: (1) Those that fix the demand for farm products and (2) those that fix supply of farm inputs. In these terms, the enterprises selected for special consideration are cotton, livestock, and related crops. Tobacco is not given detailed attention because of limited space and also because such attention would not affect materially the conclusions of our analysis.

With respect to cotton, the main fact is that although American producers face formidable competition from foreign growers and manmade fibers, the long term outlook for the cotton industry as a whole is not dismal. However, this may not be true for most of the non-delta sections of the Old South.

That foreign producers are stiff competitors is reflected in the fact that the average annual increase in world production of cotton has been more than twice that of the United States from 1920 to 1953. During the last 5 years (1953–57), world production outside the United States declined by only 900,000 bales as compared with about 5.5 million bales in the United States.[6] As a result, American growers depend increasingly on the domestic market. Cotton exports during the last quarter-century have become a constantly decreasing proportion of total cotton production, except for World War I years and 1956 when a stepped-up export subsidy program boosted cotton exports to their highest point since 1934.[7]

Manmade fibers appear to be even more serious than foreign producers in competition with American cotton. Domestic consumption of all fibers per capita increased at an average annual rate of approximately 0.3 pounds since 1930, but the increase in manmade fibers has proceeded faster—at more than 0.4 pounds per year as compared with nearly 0.2 pounds of cotton.[8] More importantly, from 1940 to 1955 uses of manmade fibers increased from 3.5 to more than 11 pounds per capita while uses of cotton declined from 30 to about 26 pounds.

Yet despite these competitive pressures, the long-term prospect is one of expanding demand for American cotton mainly because of rapid population growth, both at home and abroad. Technicians have projected a 1975 demand for American cotton ranging from 18 to 23 million

[4] Derived from data in *United States Census of Agriculture*, 1954, Vol. 2, General Report, pp. 1162–1167.

[5] Derived from data in *United States Census of Population, General Characteristics*, 1950.

[6] For 1920–1946, derived from Table 105 through 107, in *Statistics on Cotton and Related Data*, United States Department of Agriculture, Statistical Bulletin No. 99, Washington, D. C., June 1951; for 1947–57 from Tables 1 and 2 in *Cotton—World Statistics*, Quarterly Bulletin of the International Advisory Committee, South Building, Washington, D. C., July 1958, Vol. II, No. 3.

[7] Derived (1) from Cotton Export Figures for 1930–1949 in Table 9, *Statistics on Cotton and Related Data*; for 1950–51, Table 18, *Cotton Situation*, Agricultural Marketing Service, United States Department of Agriculture, November 1957; for 1952–56, Table 16, *Cotton Situation*, February 1958; and (2) from Cotton Production for 1930–1946 in Table 13, *Statistics on Cotton*, June 1951; for 1947–56 in Table 2, *Cotton—World Statistics*.

[8] Based on Table 42 of 1957 *Agricultural Outlook Charts*, United States Department of Agriculture, Agricultural Marketing Service and Agricultural Research Service, Washington, D. C., November 1956.

bales, depending on the price levels assumed.[9] The lower figure represents a 30-percent increase over the 1953–57 average cotton output, while the larger figure represents a 67-percent increase.[10]

While long-run demand prospects thus portend a favorable future for cotton farmers as a whole, past trends strongly suggest the opposite for most of the Old South outside the delta. Compared with the 1928–32 period, total U. S. cotton production in the 1953–57 period declined by 5 percent, while that of the Southeast decreased by more than 37 percent. But production in the delta increased by nearly a third, and in most of the irrigated West it increased over five-fold. The decrease was frequently 60 percent or more in State segments of type-of-farming areas of the Old South. Only in the Coastal Plains section of South Carolina has the decline been negligible.[11]

Except for the Delta, the operation of at least three factors may result in further drastic shifts of cotton production from most sections in the Old South to other regions. These are (1) comparative yields, (2) the lack of a more productive cotton technology suitable to the Old South, and (3) a rapidly growing gap between returns to labor in cotton farming and nonfarm employment in the Old South.

In greater detail, the 1953–57 per-acre cotton yield in the irrigated West was 2.5 times that of the Southeast—nearly 860 pounds as compared with 340 pounds.[12] Again, largely because of the inapplicability of cotton machine technology in much of the nondelta portions of the Old South, returns to scale in cotton farming are relatively small.[13] This means that cotton ceases to be worthwhile if labor becomes scarce enough to boost its price appreciably, relative to prices of other factors. To illustrate, in their analysis of alternative enterprise combinations on small dairy farms in the Piedmont of North Carolina, Faris and McPherson found that cotton and tobacco dropped out when the wages of labor increased from 60 cents to $1.00 per hour with milk at approximately $5.50 per hundredweight.[14]

Thus a chief threat to cotton in the Old South is the potential drain-off of its cheap labor supply by an increasing disparity between returns to workers in farm and nonfarm employment. Residual farm income per worker on commercial farms in this area was approximately $760 per year in 1949.[15] There is little reason to suppose that present labor returns from cotton farming differ appreciably from this figure. In contrast, it is estimated that the average annual return to labor in manufacture has risen from about $2,300 in 1950 to more than $3,200 in 1955—an increase of over 37 percent.

The consequence is that the farm labor force averaged a 4.4-percent decline per year in the Old South from 1950 to 1957 inclusive, as compared with 3 percent in the rest of the United States. Assuming continuation of current rates of economic growth, there are no apparent grounds for supposing that this rapid labor exodus will slacken appreciably in the visible

[9] Based chiefly on projections of domestic consumption and exports by F. Daly, *Prospective Demands for Food and Fiber*, in papers submitted by panelists appearing before the Subcommittee on Agricultural Policy, 85th Congress, United States Government Printing Office, Washington, D. C., 1957, Table 2, p. 110; Raymond A. Iones, *Projections of Foreign Demand for Selected United States Agricultural Products*, 1965 and 1975, in previous reference, Table 1, p. 119; and Rex F. Daly, *The Long Run Demand for Farm Products*, Agricultural Economics Research, Vol. VIII, No. 3, July 1956, Table 6, p. 13.

[10] The lower figure is based on farm price levels fairly close to those of 1956 and the second figure on levels that approximate 1956 world prices for major export crops.

[11] Based on John M. Brewster, *Cottonseed—Supply Areas*. Statistical Bulletin No. 90, United States Department of Agriculture, Washington, D. C., May 1950; data brought up to date for purpose of this paper.

[12] United States Agricultural Marketing Service, *The Cotton Situation*, Washington, D. C., May 1958, Tables 11 and 12, pp. 20–21.

[13] Derived from Robert Glasgow, *Farmers and Farm Production in the United States*, Special Reports, United States Census of Agriculture, Vol. 3, Ch. 2, Tables 6, 25 and 37.

[14] Faris, J. E., and McPherson, W. W., "Application of Linear Programming Analysis of Economic Changes in Farming," *Review of Economics and Statistics*, Vol. 39, November 1957, pp. 427–28.

[15] Derived from numbers of farms, number of workers per farm, and labor returns for farming areas 9, 11, 12, 13, 29, 30, 31, 52, 54, 58, as shown in Tables 4, 7, and 9; Strand, Edwin G., *Productivity of Resources used on Commercial Farms*, U. S. Dept. of Agriculture Tech. Bul. No. 1128.

future. This could lead to further drastic declines of cotton in another decade or so.

In this event, there may be marked substitution of high capital for low labor-using enterprises, such as beef, dairy, and poultry. In 1954, these enterprises accounted for 27 percent of the total value of sales as compared with only 16 percent in 1940.[16] Even more impressive is their absolute growth. For every 100 pounds of cattle and calves sold in 1940, nearly 250 pounds were sold in 1957.[17] Commercial broiler output is 34 times larger than at the beginning of this period. Production of hogs, sheep, lambs, beef cattle, broilers, and eggs is expanding at an appreciably faster rate in the Old South than elsewhere.

Present production and consumption of beef and milk in the Old South are not far apart, but the output of eggs, sheep, and hogs would need to be expanded by about 35 to 50 percent to close the current gap. However, much larger market outlets would be needed to provide opportunity for any far-reaching conversion of high labor to high capital-using enterprises. These may be brought about by economic growth and population increase within a generation. For example, egg production in the Old South probably would need to be increased over the 1957 level by more than half to supply consumption requirements in 1975.[18] Our best guess is that milk production would need to be expanded by at least 18 percent.[19] Using Purcell's estimated 1975 per capita meat consumption,[20] the 1957 combined production of cattle, calves, hogs, sheep and lambs would need to be increased by more than 50 percent to supply the 1975 projected aggregate meat consumption of this region.

Expansion of livestock farming to this point would maintain aggregate value of output at about present levels, even if cotton virtually disappeared in most of the Old South outside the Delta.[21] Such a changeover would call for more capital than the usual cotton farmer has. This in turn would greatly magnify risk and uncertainty. It would call for radical changes in managerial habits and in the prevailing system of farm processing and marketing facilities of the region. This is a large order of turn-abouts, but they are already underway and may continue at an accelerated rate.

For at least three reasons, this does not mean that all land now in high labor-using crops could be converted to other farm uses. (1) In areas of rapid industrial urban and suburban growth, the value of large acreages of land may increase to a point at which they are unavailable for agricultural uses. (2) Again in considerable measure, land going out of cotton may be precluded from entering livestock uses by competition in other areas. It is generally conceded that available pasture technology may enable the Old South to compete successfully with other regions in fluid milk and beef production. But this principle may not apply to hog production. While there is some speculation that the South may preempt Corn Belt hogs as it did Corn Belt poultry, it should be observed that by tradition, training, and experience the Corn Belt farmer is a highly competent hog producer. Moreover, he enjoys a comparative advantage in production of feed supplies, and as his hog enterprise is essential to his survival, he will seek to keep it with all the diligence at his command. Finally, (3) shifting much present-day cottonland to livestock uses may be precluded by the greater profitability of trees. This possibility is suggested, for example, by the estimate of Butler and Lanham that, in the upper coastal plains of South Carolina, net returns from production of trees would be equiv-

[16] Derived from sources cited in footnote 3.

[17] Derived from production data developed by U. S. Agricultural Marketing Service, and issued in the following publications: *Meat Animals, Farm Production, Disposition and Income by States; Milk, Farm Production, Disposition and Income; and Chickens and Eggs, Farm Production, Disposition Cash Receipts, and Gross Income by States;* April 1958 and earlier years.

[18] Based on population data as shown in *Current Population* Reports, U. S. Bureau of Census, Series P-25, No. 160, August 1957, and 1955 per capita consumption in a week in the spring of 1955 as shown in U. S. Agricultural Marketing Service, *The National Food Situation*, Washington, D. C., p. 22.

[19] Based on population data cited in footnote 17 and the 1944 per capita consumption of fluid milk products in *Consumption of Fluid Milk and Cream*, U. S. Dept. of Agriculture Marketing Research Report 72, May 1954, p. 13.

[20] Purcell, Joseph C., *Prospective Demand for Meat and Livestock in the South*, Marketing Research Report No. 99, AMS, U. S. Dept. of Agriculture in cooperation with State Agricultural Experiment Stations of the Southern Region, October 1955, p. 60.

[21] Based on sources cited in footnote 3.

alent to 6 percent on an investment compounded annually over a period of 60 years.[25]

III

The question now arises as to what sort of agricultural structure may unfold in the Old South from the pronounced changes now underway and in prospect. In broad outline, the future structure may differ sharply from the present one in at least four respects.

(1) We can expect the reorganization of commercial agriculture into much larger farms, thereby radically reducing their total number. Already, commercial farms producing sales of less than $2,500 are disappearing at the rate of approximately 40,000 per year.[26] At this rate, the remaining half-million such farms would virtually disappear within the next 15 years. There is no apparent reason to expect this rate of disappearance to slacken in the near future. The 1950–54 decline of nearly 200,000 commercial farms producing less than $2,500 worth of sales was accompanied by an increase of more than 75,000 in the number of larger farms, and a 12-percent net decline in all farms. At this rate, the 1954 system of nearly 875,000 farms would be reorganized into not more than 500,000 larger units by 1975, representing a decline in the commercial farm population from nearly 4.4 to about 2.5 million people.

(2) The sharecropper system might virtually disappear by 1975. From 1950 to 1954, approximately 67,000 sharecroppers disappeared—a decline of 17,000 per year. At this rate the 1954 total of approximately 233,000 croppers would be gone in another 15 years.[27] In this connection, Langsford has observed that a considerable part of the past and prospective decline of commercial farms may simply reflect the rapid disappearance of croppers.[28] For example, there were nearly 123,000 fewer commercial farms in 1954 than in 1950. It is commonly assumed that, by and large, sharecroppers represent commercial farms rather than residential or part-time units, as defined by the census. If so, about half of the total decline in commercial farms was achieved through the exodus of croppers rather than through reorganization of land into larger farms.

(3) It is questionable, however, whether the current and prospective reorganization of agriculture will result in appreciable closing of the gap between the economic size of farm in the Old South and the rest of the United States. The total decline of all commercial farms in the Old South has occurred among units producing sales of less than $2,500; elsewhere the decline has been among units producing less than $10,000.

Finally, (4) a mixture of farm and nonfarm employment may increasingly characterize the reorganization of agriculture into larger farms. By 1954, the proportions of farm operators doing various amounts of off-farm work were very nearly the same in the Old South as elsewhere, whereas in prior years the proportions were considerably smaller.[29]

IV

Attention is now directed to the fourth phase of our problem: Can the pronounced changes now underway, and in prospect, be expected to raise substantially the income levels of farmers in the Old South?

The recent decade is distinguished for its rapid rates of economic growth. But this growth is not reflected in higher returns to farm families. Since the 1947–49 period, in the Nation as a whole, net income per farm has declined some 12 percent while prices rose 14 percent. By 1956, "the purchasing power per farm declined about 22 percent." As a result, net purchasing power per farm in 1957 was at about the same level as in 1941. "In contrast, the purchasing power of the average weekly earnings in manufacturing had risen more than 40 percent since 1941 and more than 30 percent during the last 8 years" (1949–57).[30] During these years the decline in

[25] Butler, C. P., and Lanham, W. J., *An Economic Appraisal of the Conservation Reserve Program in Area III B, Upper Coastal Plains of South Carolina*, Dept. of Agricultural Economics, S. C. Agr. Expt. Sta., Dept. of Agricultural Economics, AE 135, February 1958, p. 48.

[26] Derived from sources cited in footnote 4.

[27] *Derived from United States Census of Agriculture*, 1954, Vol. 1, State Reports, Table 3; Vol. 2, General Report, Table 3, p. 954.

[28] Paper prepared for meeting sponsored by Agricultural Committees, Georgia Bankers Association and Division of Agricultural Economics, College of Agriculture, University of Georgia, February 20, 1958, Table 2.

[29] Derived from *United States Census of Agriculture*, 1954, Vol. 2.

[30] Koffsky, Nathan M., and Grove, Ernest W., *The Current Income Position of Commercial Farms*, papers prepared for the Subcommittee on Agricultural Policy, 85th Congress, U. S. Govt. Print. Off., November 22, 1957, pp. 81–82.

purchasing power per farm in the Old South was nearly $35 per year.[28]

Farm people have been able to about hold their own by increasingly supplementing their farm income from nonfarm sources. In the 1947–49 period, the earliest for which data are available, off-farm income averaged $1,090 and constituted 30 percent of income per farm family from all sources. Rising each year to $1,800 in 1956, this average constituted nearly 45 percent of all income per farm family. For farmers as a whole, income from all sources per family has hovered around $4,000 since 1951.[29] Regional breakdowns of total income per farm family are not available.

From these observations, it appears that the farmer has been in a situation where he has had to virtually run himself to death in order to keep standing still. With respect to the present decade, two things appear certain: (1) With the shifting of many farmers to other employment, considerably fewer farm people are saddled with relatively low incomes. (2) There is a possibility that the income position of farmers generally, and in the Old South particularly, may be brighter in the foreseeable future than in the past.

V

Consideration of this possibility merges into our fifth question: Within the visible future, can current patterns of economic growth be expected to narrow appreciably the income gap between farm and nonfarm employments as a whole, and between farming in the Old South and other segments of the economy in particular?

Four observations are pertinent here. (1) As McElveen has pointed out, only during World War II and the immediate postwar years did the economy generate enough demand for farm products and open up enough opportunities for farm people in nonfarm employment to cause any marked increase in the per capita income of farmers relative to the nonfarm average.[30]

(2) Since 1948, per capita income of all farmers from all sources has never been more than about 56 percent of the nonfarm average, and it has drifted downward at about 2 percent per year until in 1957 it was only about 46 percent. Throughout the same period, net farm income per farm in the Old South hung around 55 percent of the average for the rest of agriculture. Whether this percentage would differ a great deal for income per farm family from all sources is a matter of question. Requisite data for a definitive answer are not available. However, the proportions of farm operators who reported various amounts of off-farm work in 1954 were about the same in the Old South as elsewhere.[31] Furthermore, wage levels are appreciably lower here than in the rest of the country. In light of these facts, it is possible that the gap between total income per farm family from all sources in the Old South and the rest of the United States is appreciably wider than the gap between net farm income per farm in the Old South and elsewhere.

(3) In the visible future, it is questionable whether even the high postwar rates of economic growth can generate enough additional demand to alleviate these discrepancies in income. By 1975, population and economic growth are expected to increase the Nation's food and fiber requirements by 40 percent above output actually attained in 1956 and 1957. These additional requirements may be met without the benefit of any additional technological discoveries, and with about one-third less labor. Meanwhile, a net addition to the store of technical knowledge is probable.[32]

(4) Finally, not since 1945 has any appreciable progress been made in closing the wide gap between per capita income of all families of the Old South and the rest of the economy. In that year, per capita income of the Southeast rose to 63.5 percent of the average in the rest of the United States as compared with 51 percent at the close of the Great Depression in 1940. This marked gain reflects the fact that between 1940 and 1945, injection of Government pay-

[28] Based on Table 2 in *The Farm Income Situation*, U. S. Dept. of Agriculture, Agricultural Marketing Service, September 1958.

[29] See table in source cited in footnote 27.

[30] McElveen, J. V., *Changes in the Structure of Farming in the South*, paper presented to annual meeting of the Association of Southern Agricultural Workers, Little Rock, Arkansas, February 3–5, 1958.

[31] Derived from data in *United States Census of Agriculture*, Vol. 2, 1954.

[32] Barton, G. T. and Daly, R. F., *Prospects for Agriculture in a Growing Economy*, paper presented at Conference on Problems and Policies of American Agriculture, Iowa State College, Ames, Iowa, October 27–31, 1958.

ments into the southern sector of the economy "increased by more than six billion dollars and accounted for about 34 percent of the total increase which took place during those years. In relative importance they doubled, while in the non-South such payments rose in relative importance by only a little more than one-fourth. On any basis of measurement, Government payments were the most important factor affecting southern incomes in this period. . . ."[33] Since 1945 per capita income of the southeastern economy as a whole has remained at about the same percentage of the rest of the United States, but in absolute terms it has risen by only $400 as compared with about $650 in the rest of the country.

VI

To different people, these observations may portend different futures, but we are unable to see in them any silver linings for agriculture in either the Old South or the rest of the nation. Under the stresses and strains of the peculiar growth patterns of our present-day economy, it appears that farmers must enter into a hard race of adjustments for years to come simply to keep from falling behind. Average annual income per farmer has remained about the same for the postwar years as a whole. In contrast, income per nonfarm family has averaged an increase of above $230 per year since 1947;[34] it may be expected to continue to rise at approximately this rate if the gross national product increased by 50 percent as expected by 1975. Although farm income has declined appreciably since 1952, nonetheless through extraordinary adjustment efforts and more off-farm work, the farmer may be able to improve his income level somewhat within the next decade or so. However, it is difficult to see how even the farmer's utmost adjustment efforts can succeed in preventing a widening of the already conspicuous income gap between himself and nonfarmers.

On this score, we are unable to draw any distinction between the agriculture of the Nation as a whole and that of the Old South. However, there is at least one respect in which the economic position of the Old South might become less favorable. For reasons previously explained, even maintaining present farm income levels in the Old South requires, by and large, an even higher rate of new capital investment than in the rest of the country. But unless such investment can raise substantially the current income level, lack of the requisite credit may prevent its being made. As the prospects of such a rise are not bright within the visible future, we are faced with the possibility that widespread low-production farms may well be a built-in characteristic of an economy whose growth patterns are those of the last decade.

[33] Hoover, Calvin B., and Ratchford, B. W., *Economic Resources and Policies of the South* (New York: Macmillan Company, 1951), p. 60.

[34] Koffsky, Nathan M. and Grove, Ernest, *The Current Income Position of Commercial Farms*, Table 2, p. 87, footnote 2.

A "NEW" CONCEPT IN WAGE DETERMINATION: DISGUISED PRODUCTIVITY ANALYSIS

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Two new concepts in wage determination, offered in John T. Dunlop's essay, "The Task of Contemporary Wage Theory,"[1] are alleged to define the points at which wage-making forces are concentrated, for they "help to focus attention upon the operation of demand and supply" and "suggest that product-market competition and conditions decisively influence the structure of wage rates."[2] The suggested reformulation of wage theory is accompanied by a rejection of marginal productivity analysis, which "has proved unsatisfactory as a tool of analysis."[3] If we are to accept the proposed reformulation, Dunlop must demonstrate that the new concepts (1) depart significantly from familiar concepts in productivity analysis and (2) are more effective than the received doctrine in focusing attention upon demand and supply and in accounting for the influence of product-market competition and conditions. The proposed reformulation can be accepted only with reservations, however, if the new concepts are disguised applications of an existing analytical tool.

I

Dunlop's indictment of marginal productivity analysis appears to rest upon a failure to distinguish, consistently, between the marginal productivity *theory* of J. B. Clark and the marginal productivity *doctrine* of Alfred Marshall.[4] Clark's theory, after all, predicts that wages tend toward the competitive level in the long-run stationary state, while Marshall's doctrine purports merely to explain the demand for labor.[5]

Dunlop indicts the Clarkian theory and the Marshallian doctrine indiscriminately in arriving at the conclusion that marginal productivity, like the wage-fund doctrine before it, has substantially collapsed on the supply side. He argues that "marginal productivity *theory*, with some notable exceptions, has not been widely applied to the complexities of wage structures," and that "the marginal productivity *analysis*," i.e., the doctrine that wages measure marginal productivity, "is not a theory of wage-rate determination" and "explains neither particular wages nor the general level."[6] Dunlop contends that "unions can no longer be treated as an aberration of the usual market determination," that "collective bargaining must be taken as the normal case," that "governmental action has impinged on wage-setting forces very generally," that the task of contemporary wage theory is "the formulation of a body of wage analysis more suitable to labor-market developments and to wage-setting institutions of the day, drawing upon the central body of economic analysis," and that "the questions that are posed for contemporary wage theory are quite different from those that challenged the wage-fund and marginal-productivity *doctrines*."[7]

* I am indebted to A. F. Chalk, W. G. Modrow, and L. H. Stern for their suggestions (some of which I accepted) on this paper.

[1] John T. Dunlop, "The Task of Contemporary Wage Theory," in George W. Taylor and Frank C. Pierson (eds.), *New Concepts in Wage Determination* (New York: McGraw-Hill, 1957), pp. 117–139. An earlier version of the essay appears in John T. Dunlop (ed.), *The Theory of Wage Determination*, Papers of a Conference Held by the International Economic Association (London: Macmillan, 1957), pp. 3–27. Subsequent references in this paper are to the version appearing in the volume edited by Taylor and Pierson.

[2] *Ibid.*, p. 139.

[3] *Ibid.*, p. 124.

[4] An excellent analysis of the development of marginal productivity theory and of the distinctions between Clarkian and Marshallian contributions is contained in Allan M. Cartter, *Theory of Wages and Employment* (Homewood: Richard D. Irwin, 1959), pp. 11–44, especially pp. 18–20 and 22–25.

[5] *Ibid.*, pp. 21–23. Cartter offers the following quotation as illustrative of Marshall's view: "This doctrine has sometimes been put forward as a theory of wages. But there is no valid ground for any such pretension." Alfred Marshall, *Principles of Economics* (London: Macmillan, 1920), p. 518.

[6] Dunlop, *op. cit.*, p. 123. Italics mine.

[7] *Ibid.*, pp. 123, 125, 126, 138. Italics mine.

These comments lead to the conclusion that Dunlop's attack is formulated in terms of the Clarkian theory and directed against the Marshallian doctrine. Dunlop recognizes that "strictly speaking, marginal productivity is not a theory of wages, but only a statement of the demand side,"[8] yet his criticism appears to be directed against the Clarkian conclusion that wages will tend toward the competitive level. The author of this paper does not consider himself to be an "unabashed defender" of marginal productivity theory and finds himself uncomfortable with "received" theory, if that term, as Dunlop uses it,[9] refers to marginal productivity theory based upon competitive assumptions in product and factor markets. Productivity analysis, i.e., analysis of a firm's demand for units of labor service, can be employed separately and distinctly from a commitment to acceptance of a long-run competitive equilibrium.

Dunlop's sketch of marginal productivity theory attributes to the theory the conclusion that the marginal value productivity of labor will equal the wage in both competitive and imperfectly competitive labor markets. That conclusion, however, is validly attributed to marginal productivity analysis only when it is assumed that the labor market is perfectly competitive, so that the supply of labor to the firm is infinitely elastic, and marginal labor cost equals average labor cost.

Following Samuelson,[10] Dunlop states: "Maximization of profits by the firm requires, simply as a logical deduction, that as an equilibruim condition the price of each factor of production be proportional to marginal physical productivity *and that the marginal value productivity of each factor be equal to its price.*"[11]

But, he adds: "This is true of any factor of production, including labor services, and holds regardless of the character of competition."[12]

Using Samuelson's definition of marginal value productivity as marginal revenue times marginal physical productivity, let us substitute the term *revenue productivity* (marginal revenue product)[13] for marginal value productivity in order to make more clear the distinction between the sales value of the marginal product and the addition to revenue resulting from the sale of the output produced by one additional unit of labor service. The profit-maximizing firm, then, will seek to hire that number of units of labor service at which revenue productivity equals marginal labor cost. Marginal labor cost equals average labor cost (the wage or the price of labor) only if the supply of labor to the firm is infinitely elastic, i.e., if the labor market is perfectly competitive. In an imperfectly competitive labor market, the supply curve of labor to the firm is less than infinitely elastic and slopes upward and to the right, so that marginal labor cost is above average labor cost: the familiar case of monopsony or "employer wage determination." Under these conditions, as the firm equates revenue productivity and marginal labor cost, the wage it pays is below the corresponding marginal labor cost, and, consequently, below revenue productivity. A monopsonistic employer, then, exploits labor.[14] The marginal value productivity of labor is not equal to its price, precisely because the labor market is imperfectly competitive. The conclusion stated by Dunlop holds only if the character of competition in the factor market is perfect.

II

The tenor of Dunlop's essay is such that one would expect its reformulation of wage theory to be somewhat more consistent with rejection of the received doctrine. Dunlop's thesis is that the task to which contemporary wage theory must set itself is analysis of "the problem of setting and variation in the whole structure or complex of rates,"[15] rather than the problem of single wage rate determination, and to indicate the interrelations between internal and external wage struc-

[8] *Ibid.*, p. 122.

[9] *Ibid.*, p. 126.

[10] Paul A. Samuelson, *Foundations of Economic Analysis* (Cambridge: Harvard University Press, 1947), pp. 87–89.

[11] Dunlop, *op. cit.*, p. 122. Italics mine.

[12] *Ibid.*

[13] Samuelson, of course, uses the term "marginal revenue product" in his principles text, *Economics —An Introductory Analysis*, 3rd ed. (New York: McGraw-Hill, 1955), pp. 483–484, and in the Fourth Edition (1958), pp. 507–509.

[14] Joan Robinson, *The Economics of Imperfect Competition* (London: Macmillan, 1948), pp. 281–283.

[15] Dunlop, *op. cit.*, p. 128, i.e., a wage structure.

tures.[16] The analysis utilizes two new concepts: (1) *a job cluster* ("a stable group of job classifications or work assignments within a wage-determining unit"[17]) and (2) *a wage contour* ("a stable group of wage-determining units . . . which are so linked together . . . that they have common wage-making characteristics"[18]).

The 1954 Round Table Conference of the International Economic Association, at which the earlier version of the Dunlop essay was presented, apparently was organized upon the basis of the assumption that labor economists can be clearly distinguished from general theorists.[19] Although not to be specifically directed toward Dunlop's endeavors in "The Task of Contemporary Wage Theory," it would seem that Boulding's evaluation of the apparent conflict between economists and industrial relations specialists[20] is applicable to the popularity of the "whipping boy" approach in appraisals of marginal productivity analysis. It is disconcerting to find that rejection of the competitive model of marginal productivity theory is frequently accompanied by rejection of the marginal productivity doctrine, as well, and by the contention that contemporary analysis must forge new tools—when the tools, in reality, are familiar concepts parading under new labels.

III

A plant's wage structure, according to Dunlop, is comprised of a limited number of job clusters determined in the short run by concomitant institutional forces: technology, administrative organization, and/or social custom. A group of closely interrelated jobs requiring similar skills and training of the incumbents, with common promotion, transfer, and layoff patterns, becomes a job cluster.[21]

Dunlop cites the following examples of job clusters which are determined, in the short-run, by institutional forces: machinists operating various specialized machines (training and skill), the crew of a train or plane (technology), employees in a department (administrative organization), and sales girls in a department store or

[16] *Ibid.*, pp. 128–129. The internal wage structure exists within "a bargaining unit, plant, firm, association or other grouping in which wage differentials are set by the same authorities," while the external wage structure is "the complex of interfirm or group structures each set by different agencies."

[17] *Ibid.*, p. 129.

[18] *Ibid.*, p. 131.

[19] Dunlop's introduction to the proceedings of the conference, *The Theory of Wage Determination*, p. xi, states: "Labour specialists have a contribution to make on such matters as the behaviour of labour organizations and managements, the degree of flexibility of the wage structure in response to relative changes in employment and other factors, and the impact of labour organizations on the operation of otherwise unorganized labour markets. General theorists, in turn, emphasize the common elements in the experience among countries: the role of wages in inflation, the relations between wage policy and monetary and fiscal policy, the relations between wages and transfer payments, and the factors determining the structure of wage differentials."

[20] Kenneth E. Boulding, "Collective Bargaining and Fiscal Policy," *American Economic Review*, Proc., May, 1950, 40, p. 306. "The study of industrial relations has now spread so far beyond the limits of economics that the economist in these days has considerable difficulty in persuading students of labor that his discipline has anything to contribute to their studies. It is not enough for him to confess—as in all honesty he should—that economics comprises no more than about 20 per cent of the subject, and that the rest is sociology, social psychology, individual psychology, psychiatry, anthropology, law, engineering, political science, etc., with perhaps an occasional dash of philosophy, ethics, and even physics to improve the flavor. There is a strong (and to my mind a deplorable) tendency among the bright young labor specialists not merely to let economics go by default out of ignorance, as was customary among the older generation of writers on this subject, but to cast it out of the window bodily, with shrill cries of jubilation. One can hardly pick up a book on labor nowadays without finding the author jumping gleefully on what he thinks is the corpse of Demand-and-Supply, or proclaiming with trumpets, 'The Labor Market is Dead, Long Live Human Relations.'"

[21] Dunlop, *op. cit.*, p. 129. E. Robert Livernash's essay in the same volume, "The Internal Wage Structure," elaborates upon the concept of a job cluster as a job group "within which internal comparison is most significant," (p. 148) and states that rates applicable to jobs within the groups are determined through comparison with the key job or jobs within the cluster. Livernash appears to contend (p. 149) that, while internal comparison serves as the basis of wage determination, a subjective element of "general judgment," rather than job-content, determines the appropriate wage relationships between clusters.

the stenographers in an office (social custom).[23] It would appear reasonable to assume that each unit of labor service within each of these examples of job clusters is employed in conjunction with approximately the same average quantity of fixed factors. Interchangeability of labor inputs within each of the groups exists as a possibility. The clustering of jobs (and of wage rates in most of these examples) is determined by the additions to revenue resulting from the outputs of additional inputs of labor service—as well as by the institutional forces cited by Dunlop.[24] The fact that wage rates applicable to units of labor service within a cluster may diverge from the revenue productivity of the marginal unit reflects, simply, the fact that labor is not infinitely divisible.[25]

Job clustering occurs, then, because an employer finds machinists, crew members, clerical employees, or department stores sales personnel to constitute relatively homogeneous groups in terms of skill, training, technology, or social custom—*and* productivity. The establishment of wage differentials between the key job or jobs and other jobs within the group is based upon differentials in productivities. The fact that "certain job clusters may be more closely related to some than to other clusters"[26] is further indication of the role of the revenue productivity associated with each unit of labor service within each of the clusters. The employer's demand for a particular kind of units of labor service reflects not only the relationship between jobs within a cluster but the interrelationship between clusters as well. Historical wage differentials and union wage scales would appear to serve as further reflections of productivity differentials. A job cluster might appropriately be redefined as consisting of a group of job classificatons or work assignments which is stable because of the equivalence of the contributions of the clustered jobs to the firm's total revenue.

The stable group of wage-determining units—a wage contour—exhibits common wage-making characteristics reflecting "(1) similarity of product markets, (2) resort to similar sources for a labor force, or (3) common labor market organization. . . ."[27] The case for Dunlop's new concepts seems to rest upon their application to the union scale for motor-truck drivers in Boston for July, 1953. In fact, Dunlop considers this case to constitute "a kind of critical experiment," for a diversity of wage rates exists among "essentially similar and substitutable" teamsters "performing almost identical work, organized by the same union."[27] Dunlop expresses his belief that negative answers can be provided for the following questions relating to this case: "Are the disparities temporary? Do they arise from 'friction' or 'immobilities' in the labor market? Are they primarily the consequence of a monopolistic seller of labor discriminating among types of employers?"[28]

Certainly, Dunlop is entitled to his belief that the wage diversities do not arise from immobilities of labor between the various industries. But his essay does not demonstrate, either deductively or through the presentation of empirical evidence, that immobilities are to be dismissed as the possible explanations of the diversities.

Each hourly rate, according to Dunlop, "reflects a wage contour," and "is a reflection of the product market."[29] Differentials among contours reflect differences in product markets back into the labor market, and short-run differentials reflect the fact that "newer and expanding indus-

[23] *Ibid.*, pp. 129–130.

[24] Decisions by employers to hire a specific number of units of labor service, or to change the number of units employed, are based upon comparisons (whether they be conscious and calculated or of the trial-and-error variety) of revenue productivities and additions to labor cost. The job cluster, being determined by institutional forces, may describe some of the forces which affect the employer's demand for labor services. However, the employer's decision, although affected by institutional forces, seems still to be dependent upon the revenue productivity function. The basic question, it would seem, is whether the job cluster is a device which aids in the prediction of changes in wages and/or employment or is merely a rationalization of existing wage structures. When it is used for purposes of prediction, the job cluster must consider productivity and becomes "revenue productivity affected by institutional forces."

[25] The "range of indeterminateness," after all, is limited by the internal and external marginal products and reflects the elasticity of demand for labor. See J. R. Hicks, *The Theory of Wages* (New York: Peter Smith, 1948), pp. 24–26.

[26] Dunlop, *op. cit.*, p. 130.

[27] *Ibid.*, p. 131.

[27] *Ibid.*, pp. 134–135.

[28] *Ibid.*, p. 135.

[29] *Ibid.*

tries or contours, such as oil, have had to pay higher wages to attract labor in the evolution of wage scales."[50] Dunlop contends that historical precedent causes the relative rates among contours to be regarded as "proper." In addition, he states:

> A minor part of the explanation lies in the fact that these wage rates are influenced by the wages of the groups of workers these employees tend to be associated with in work operations. Teamsters hauling oil and building materials come in contact with high-paid employees in their work operations, while laundry and scrap drivers have more direct contact with lower-paid employees. *A larger emphasis is to be placed on the fact that competitive conditions permit higher pay at the top end of the list.* Demand is less elastic and wages tend to be a lower proportion of sales revenue.[51]

The level of a wage contour is dependent upon the ability of an employer to pay wage rates above, below, or equal to those associated with existing contours. For instance, teamsters hauling oil come into direct contact with more highly-paid employees than do laundry drivers; and, of course, this would be expected. The higher value of the product and the higher capital-labor ratio in the petroleum industry result in a higher productivity per unit of labor service. It would seem, however, that the persistence of a wage diversity in the case of teamsters in the two industries would stem, in the final analysis, from immobilities of truck drivers from laundries into the petroleum industry.

I would suggest that a wage contour might be redefined as a stable group of wage-determining units which reflects (1) the amount of fixed factors available for use by each unit of labor service, (2) the percentage of each firm's total cost accounted for by labor costs, and (3) the ease with which each firm can pass on wage increases to purchasers of its product.

The mirroring of the product market into the labor market tending to determine the wage structure[52] and resulting in wage differentials for virtually identical units of labor service is recognized by Dunlop to "reflect different product-market competitive conditions."[53] Dunlop also recognizes that the introduction of new plants into the communities of a growing economy reflects higher productivities. He states:

> The new industries may require higher standards of skill. The new plants may need several thousand employees as a minimum work force. A higher rate is needed to attract that number than if the plant were to grow gradually from a small figure. Labor costs are frequently a small fraction of total costs, and the product markets are often oligopolistic. These factors permit or encourage an enterprise to set a higher rate for the key jobs than would be paid for a comparable level of skill in other jobs in the community. The oil, chemical, atomic and television industries provide current examples. All this suggests that there is a tendency for new industries to push the wage level upward.[54]

In other words, the revenue productivity of a unit of labor service will be greater in a large firm than in a small firm; it will tend to be greater in an imperfectly competitive firm than in one which approaches the model of perfect competition.

IV

The introductory section of Dunlop's essay leaves the reader with the impression that the suggested reformulation will, at the very least, constitute a step toward a correction of the major deficiency of marginal productivity analysis: its collapse on the supply side. Labor economists appear to be in agreement with Dunlop's quotation from Robertson to the effect that "wages tend to measure the marginal productivity of labor"[55] and with Dunlop's statement that "this is not a theory of wage-rate determination."[56] A recognition of the failure of the marginal productivity theory to explain the supply of labor does not, however, appear to warrant the conclusion that the theory "has proved unsatisfactory as a tool of analysis," for the merit of modern marginal productivity analysis lies in its ability to provide a tool for analyzing the demand for labor, considering a variety of product market conditions. If the wage contour differs significantly from existing tools, it is a new concept; if it is conceptually similar to existing tools, it is a restatement of a useful portion of orthodox theory and is not, in reality, "new." If, on the other hand, the wage contour explains the supply of labor, it corrects

[50] *Ibid.*, p. 136.
[51] *Ibid.* Italics mine.
[52] *Ibid.*
[53] *Ibid.*, p. 137.
[54] *Ibid.*
[55] *Ibid.*, p. 123.
[56] *Ibid.*

the major deficiency of marginal productivity analysis.

The wage contour does not attempt to analyze the supply of labor. It does not, therefore, cope with the theory's major deficiency, and we are left with a system of analysis which does not explain wage-rate determination. The wage contour is, however, an analysis of the demand for labor, and its merits must rest upon its ability to provide an explanation of labor demand more adequate that that which is already available.

Since a wage contour is defined as "a stable group of wage-determining units . . . having common wage-making characteristics,"[27] we must examine the forces which contribute to those common characteristics. Dunlop finds that wage contours reflect the elasticity of product demand and the firm's labor cost–total cost ratio by "mirroring" product market conditions.[28] In other words, each contour reflects the fact that the firms within the group of wage-determining units experience approximately the same labor-capital ratios and face similar marginal revenue functions in their product markets. The wage contour, then, is an industry-wide view of the addition to each firm's total revenue resulting from the output of one additional unit of labor service, but it seems to be no more effective than the received doctrine in focusing attention upon demand and supply and in accounting for the influence of product-market competition and conditions.

The wage contour of a particular firm of industry for a specific kind of labor service is a reflection of the forces which, according to marginal productivity analysis, affect (1) the slope of the marginal revenue product function, (2) shifts in the marginal revenue product function, and (3) the divergence of the marginal revenue product function from, or its identity with, the value of the marginal product function. The wage contour is the marginal revenue product function in an industry-wide disguise.

V

It was the purpose of this paper to question the basis upon which Dunlop's suggested reformulation of wage theory constitutes a departure from existing marginal productivity analysis. Perhaps Dunlop's analysis is "brilliant as far as it goes,"[29] since it does provide two new terms to be utilized in analysis of wage determination. But does it, in the final analysis, warrant the assertion that the marginal productivity theory has "proved unsatisfactory as a tool of analysis" or that the new concepts suggest more effectively than does the marginal revenue product concept "that product market competition and conditions decisively influence the structure of wage rates"?

[27] See fn. 26.

[28] Dunlop, *op. cit.*, pp. 135–136.

[29] Sar A. Levitan, "Review of New Concepts in Wage Determination," *American Economic Review*, March, 1958, 48, pp. 222–224.

THE ECONOMY, LIBERTY AND THE STATE*

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Graduate students and teachers in Economics will long think of this new book by Professor Hoover as falling neatly into Bacon's third class of books: "some few [are] to be chewed and digested." It is concerned with the movements that are and long have been underway in this and other capitalist countries, and in the conditions that prevail in totalitarian countries. Hoover is especially interested in liberty which he regards not as a means to economic welfare but as an end in itself. It is to him a good of high price. The book is not one in Economics old-style but in Political Economy new-style.

The forces that are operating wherever capitalism exists are, to him, inexorable, and their chief source is in the conduct of businessmen. These forces, he thinks, are not necessarily carrying us into Elysian fields but perhaps toward a pit where there is no liberty.

He is greatly concerned that where capitalism has been destroyed, as in Russia, there is rule by a dictator who permits no liberty whatever in opposition to his will or whim under penalty of death without trial. He does, however, see trends that hold hope for economic welfare and liberty.

In his first chapter he concludes that old-style capitalism is dead and gone. That economy was based on the trinity of private property, competition and laissez faire. He notes that the institution of private property "gave the absolute right to receive income without the obligation of service to be rendered." He says that "unrestricted private property, particularly when associated with the institution of unlimited private inheritance, is so vulnerable from the standpoint of social equity that one might well wonder how an economic system based upon it could exist . . .," yet it was "more absolute in the United States than in any other country." That is, the state had more completely "withered away" here than anywhere else. But despite Marx and his followers, as old-style capitalism has given way either by revolution as in Russia, or by increased limitation on private property as in this and other countries, the state has increased in power.

Hoover finds the turning point away from old-style capitalism in the rise of the corporation and the increase in the size of the producing unit. This together with the " 'built in' susceptibility of the system to economic crises" and many other pressures compelled a retreat from laissez faire to government regulation. These various pressures have come "inevitably" from "the modern complex, technological society."

Four chapters of 134 pages are given to Russia. This quiet scholar does not mince words as he reports on "the grotesquely repulsive characteristics of Soviet totalitarianism." Stalin's "ruthless brutality" knew no bounds—none whatever. This has to be the case, says Hoover, whenever a person rules without representative government. The death penalty with all of its accompanying terror must be used to prevent the rise of any opposition or of any sign or hint of disaffection by any associates of the tyrant or by any organization or group that might challenge his power. In short, as Hoover puts it pithily, under Stalin each individual was made to feel "that he was utterly alone in any opposition to the regime."

He suggests that "Bloody Sunday" in 1905 when the Tsar's soldiers fired upon a crowd of persons who had marched to the Palace to beg for a redress of grievances could not have occurred under Stalin. This is not because Stalin would have hesitated a moment in ordering his soldiers to shoot down unarmed petitioners, but because the crowd could not have gathered in the first place. Anyone attempting to organize such a protest march would have been unceremoniously killed.

As early as 1930, Hoover says, Stalin correctly called his power "the most potent and mighty of all state authorities that have existed down to this time." Khrushchev's attack on Stalin three years after his death was perhaps actuated, says our author, by the fear that an opponent might

* This essay is a review article of Calvin B. Hoover's *The Economy, Liberty and the State*. New York: The Twentieth Century Fund, 1959. Pp. 445. $5.00.

charge him with contributing to the death of the "great and beloved" Stalin. Hoover states that if Stalin had not died when he did, perhaps by assassination, he might have let loose the greatest purge in his career and that this "would apparently have included those who had been closest to Stalin and who in fact were to be his successors."

Hoover expects nothing much better from Khrushchev, although he reports some relaxation of the tyranny. But if Khrushchev is to stay in power he must make himself feared as Stalin was, and escape Stalin's fate as long as possible. There was no escape from Khrushchev's execution, or murder, of Beria, who himself had had thousands of persons put to death. He was not liquidated because of his atrocities but because he had too much power to permit the new tyrant to sleep soundly at night. The privilege of assassination is a necessary part of Communist totalitarianism.

The elite in Russia are given money and prestige and freedom in narrow lines and accept these in exchange for the sacrifice of political or any other liberty that is displeasing to the tyrant. Education, he notes, is "consistent with the economic and political system.... It is authoritative. It emphasizes the training of an elite rather than the masses." "The potentialtities of such a system for reducing the p oblem of the 'Blackboard Jungle'... should not be underestimated."

In the economic realm the tyranny has realized certain beneficial results. Russian statistics, Hoover notes, are still tailored to the regime, but on recent visits he saw some improvement in conditions. The standard of living is, he guesses, about one-fifth that in the United States, but, he warns, if this is considered "as an estimate of Soviet industrial war-making potential, this would be a serious underestimate...."

He is somewhat alarmed at the current growth in the Soviet Economy, which according to his "crude estimates" are "almost twice the past rate in the United States." Whether our growth can be maintained "at a satisfactory rate without an unacceptable degree of inflation will be a major factor in world-wide appraisal of the comparative success of the Soviet and the modern Capitalistic economic systems."

One wishes that Hoover's scholarly report on Russia could be read extensively throughout the world and especially in the West, including this country. This would help us to understand life in Russia, and contrary to pious assertions that this would lead to loving affection, it would strengthen the determination to resist this monstrous tyranny. It is almost impossible for one reared anywhere in the West to believe that conditions concerning liberty in Russia can be as bad as this book depicts them to be. A careful reading of it can hardly fail to carry conviction.

In the chapter, The Nazi Totalitarian System, Hoover points to many factors that contributed to Hitler's accession to power, but regards the economic depression as the major one. This included our depression and the consequent decrease in imports from Germany. Both Nazi and Fascist systems, no less than a Soviet one, "is always headed by a dictator who has no legal limits upon his power." The big difference, he notes, is that the capitalists are liquidated when the Communists take power but are spared in the other regimes so long as they cooperate. And in Germany, he says, "once Hitler was in power ... industrialists ... collaborated with him completely."

There were marked economic gains under Hitler. By 1939 "some two million jobs" were available which could not be filled, and industrial production in 1938 was more than double that of 1932.

Despite the brutality of the regime and the ravages of the war "for which Hitler ... was as personally responsible as any man in history has ever been," the author warns that "if a severe and prolonged economic depression should occur, or if the conflict between economic groups and classes should become irreconcilable in any important country, it is likely that some sort of totalitarian government would again take over ... accompanied by new trappings and a new propaganda mystique but equally destructive of human liberty."

In this chapter Hoover raises the pertinent question as to how far a democratic government can go in suppressing a totalitarian movement that will, if successful, destroy democratic government.

He returns to a consideration of the United States economy and notes that the comprehensive program of the New Deal brought "general agreement" that "momentous changes had occurred" in our economy, whereas "there was little realization that the economic system had already undergone substantial transformation prior to the first Roosevelt administration...." "Even among economists," he adds, "comprehension of the

transformation . . . developed slowly and not always with unanimity."

"It is a confusing and inconvenient paradox," he says, "that the maintenance or the restoration of competition is inconsistant with a policy of complete laissez faire although the maintenance of a policy of laissez faire depends upon the maintenance of individual enterprise and competition."

He sums up his analysis of business and labor by saying "if government intervention has seemed necessary in the past because management and labor leaders had *not* been able to agree, it may well be that government will have to intervene in the future because they *do* agree."

A very significant change in the character of our economy, he says, is seen in "the virtual independence of corporate management of stockholder control. . . ." "To the extent," he adds, "that corporate managerial capitalism has replaced management by capitalists per se, the system is fundamentally altered." "Indeed, the position of the management would not necessarily be much changed if the corporation were nationalized." This development is not strange in the corporation since the management "of a labor union, a farm organization, a cooperative or any other large organization . . . tends to be self-perpetuating."

He notes that the ability of corporate management to elect its board of directors and to set its own salaries is of growing concern. He cites one company that a few years ago "had eleven of the eighteen highest-paid corporation executives" in the country with one official receiving in 1956 compensation in excess of $800,000. Men who wish to tear down their own houses could hardly do better than that.

This section closes with an expression of concern as to whether "the movement toward statization . . . can be permanently halted short of the danger zone where liberty begins to be seriously curtailed. . . ."

In his discussion of Great Britain, the author points to changes away from old-style capitalism such as have occurred in the United States. One of his most significant items is that the leaders of the Labor Party are beginning to think of socialism not as "a statized economy" but as leading to a wide distribution of property, more equalization in income, and "the reform of the boards of management of firms still further in the direction of responsibility toward the public." Nationalization, he observes, has become "a poor issue to take to the polls." "This would be," he notes, "as much a departure from old-style socialism as from old-style capitalism." "There can be little doubt," he says, "that if the Labor Party is returned to power there will be a further development of the role of the management of industrial firms as public administrators."

He observes that there are great difficulties in working out a system in which "profit maximization" and "the highest possible wages" would not be the goals of business and labor. However, "this singlemindedness . . . no longer exists" and "the development seems almost inevitable, not only in Britain but in all the economic systems of the West." He adds cautiously, "So long as such a system could be made to function, there would not appear to be a net diminution in personal liberty."

Looking more broadly to "the Western European economic systems" and allowing for many differences, our author sees in general, first, a decline in the "political and economic role of the capitalist"; a decline in "the role of property, as such, in the control of corporations and in the increasing power and perquisites of the corporate bureaucracies"; an increase in "the spread of social security benefits" and a reduction in the "ability of industrial managements to resist demands for wage advances."

Secondly, he sees "the acceptance of responsibility by all national governments for the maintenance of full employment." All of these are "just as in the United States," except for the development of an "economic *condominium* or joint rule" by government, business and labor "for the working out of national economic policy with respect to wage and price levels and the volume of employment." No longer are matters "left simply to the free play of the market."

This book is the work of a very learned man. He has keen insight, has read widely and has had rich and fruitful experience as his casual allusions and copious footnotes amply show. He is patient and cautious, and he is troubled by the complex of forces that are operating in this modern world. One can only hope that this book will trouble many others and by so doing help in leading to conduct that will promote economic welfare and foster liberty.

COMMUNICATIONS

WELFARE INDICES IN *THE WEALTH OF NATIONS*

I

Adam Smith, an old legend has it, tried to formulate a labor theory of value but got horribly confused between the purchasing power of a commodity over labor and the amount of labor embodied in its production. The origins of this legend are to be found in Ricardo's *Principles* but the authorized version is by Marx.[1] As a result, generations of critics have dealt unkindly with Smith as a theorist who identified such totally different things as the labor-price and the labor-cost of a product.

An unprejudiced reading of *The Wealth of Nations* destroys the legend. Adam Smith was well aware of the distinction between the measure and cause of value. He was little concerned with the latter. The traditional problem of value theory—why are relative prices what they are at any moment of time?—received only summary treatment. Rather he was interested in finding some invariant measure of real income. To be sure, the order of topics in *The Wealth of Nations* invited misunderstanding of his purpose. Book I, chapter 4, "The Origin and Use of Money," closes with a promise to analyze the determination of "relative or exchangeable value of goods." But the next chapter, "The Real and Nominal Prices of Commodities," attempts instead to define an intertemporal standard to evaluate changes in money prices. The determination of relative prices is not discussed until chapters 6 and 7 where Smith rejects the notion that capital can be reduced to labor expended in the past, ending up with a simple money-costs of production theory. But this conclusion does not affect the labor-yardstick advanced in chapter 5. All this would have stood out much better if chapter 5 had followed, not preceded, chapter 6 and 7.

Most of the difficulties created by the Marxian interpretation of Adam Smith have been cleared up by modern commentators. Smith's discussion of "the measuring rod of labour" is now properly regarded as a stab at subjective welfare economics, involving an effort to surmount the index-numbers problem. Few critics, however, have gone beyond generalities in discussing Smith's standard of welfare. Myint's stimulating analysis is a notable exception.[2] But Myint's analysis is not always free from ambiguity. Other readers may have been left wondering, as I was, exactly why Ricardo or anyone else should have objected to Smith's yardstick. It is to this question that the following note is devoted.

II

Smith employs a labor-standard in two distinct senses: as an index of the rate of capital accumulation and as an index of the magnitude of subjective income. The spearhead of his argument is to show that in a developing economy the two indices come to the same thing. And so they should but not upon Smith's assumptions.

The first idea is, relatively speaking, plain sailing. The notion is that capital accumulation involves a definite trend in the money value of the national product expressed in wage units (the going money wage rate of unskilled labor). In Book II, chapter 3 of *The Wealth of Nations* "productive labour" is defined as activity producing storable items of wealth, particularly wage-goods, which can put "more labour in motion" in the next cycle of production. That is to say, measuring all value in current wage units, productive labor produces physical output whose

[1] *Works of David Ricardo*, P. Sraffa and M. H. Dobb, eds. (Cambridge, Eng.: Cambridge University Press, 1951), I, p. 14; K. Marx, *Theories of Surplus Value*, translated by G. A. Bonner and E. Burns (London: Lawrence & Wishart, 1951), pp. 108–16. But see the incisive comment by J. S. Mill, *Principles of Political Economy*, W. J. Ashley, ed. (London: Longmans, Green and Co., 1909), p. 568.

[2] See M. Bowley, *Nassau Senior and Classical Economics* (New York: Augustus M. Kelley, 1949) pp. 67–71; J. A. Schumpeter, *History of Economic Analysis* (New York: Oxford University Press, 1954), pp. 180–8; H. M. Robertson and W. L. Taylor, "Adam Smith's Approach to the Theory of Value," *Economic Journal*, June 1957; H. Myint, *Theories of Welfare Economics* (Cambridge, Mass., 1948), chapter 2.

value exceeds the value of labor embodied in it.[3] This is, of course, nothing but a cumbrous way of stating that such labor normally produces a value-surplus above its cost of maintenance and replacement.[4] Now, if "net revenue" is always promptly reinvested and if the supply of labor is perfectly elastic, an upward trend in the number of wage units commanded by total output is guaranteed (p. 54).[5] Capital and labor are combined in fixed proportions (p. 421). Hence, the volume of employment will increase *pari passu* with the increase of capital. With real wages constant, the growth of output must result in a positive trend of the labor-index.

A growing labor force, Smith was wont to say, is a "decisive mark" of increasing real income (p. 70). But, on the other hand, so is a "liberal reward of labour" (p. 73). The latter, however, creates a dilemma: when real wages are rising, a positive rate of investment does not necessarily imply an increase in the purchasing power of total output over wage units. Indeed, if real wages rise as fast as the average productivity of labor, the labor-standard will show no change through time. We return to this difficulty in a moment.

Consider now the second proposition, the index of subjective income. In the chapter on "Real and Nominal Prices" Smith takes a leaf from the pages of Locke's *Second Treatise on Civil Government*, by posing the question of how to measure real income in the context of a "rude and original state of society." For all practical purposes, this is a single-factor world in which the personal labor embodied in products coincides with the labor these products can purchase. A man is "rich or poor" according to the value of his own labor services or his purchasing power over other men's labor, for the two are identical. With the rise of property income this coincidence is broken. Now real income varies solely with the ability to command other men's *products*. But as labor is irksome, everyone strives to save himself "toil and trouble" and to impose it upon others (p. 30). In one sense, what is purchased with products is still the "toil and trouble" of others. And so, an increase of real income means not merely more purchasing power over goods, but more purchasing power over labor. What is true of individual income is true of aggregate income: the wealth (read: income) of a nation is measured by the number of wage units commanded by the whole product.

This seems to be the gist of Smith's reasoning. Capital accumulation by producing a positive change in the labor-index, means an increase in subjective welfare. A standard of measurement, however, must itself be invariable to accurately reflect changes in the things being measured. On the face of it, the wage unit fails to meet this condition: it varies with every change in the price of wage-goods and in the demand and supply of labor. But supposing for the moment that money and real wages do remain the same. In what sense would this provide an invariant standard of subjective welfare? Clearly, in the sense that we could then assume that the average disutility of labor per unit of effort is the same for all individuals at all times: "Equal quantities of labour, at all times and places, may be said to be of equal [esteem] value to the labourer" (p. 33).[6]

This is surely a heroic assumption. A constant outlay of subjective sacrifice per man hour implies unit elasticity of supply of effort, or unit elasticity of demand for income in terms of effort. This is a poor assumption for an analysis concerned with welfare appraisals in the long run: a falling effort-price of income in a growing

[3] Only physical output is considered because services, being non-durable, are incapable of being accumulated. With the important exception of the transmission of knowledge, this is true enough but what difference it makes is another matter.

[4] A similar argument is used in Book II, chapter 5 to show that equal quantities of capital with equal rates of turnover "put in motion" more labor in agriculture than in manufacturing because in agriculture the value of the product is sufficient to pay rent in addition to wages and profits. This is obviously wrong if rent is an intramarginal return, as Ricardo was quick to see (*Works*, I, pp. 76–9). But elsewhere Ricardo contradicts himself, unwittingly adopting Smith's standpoint (*ibid*, p. 350, 429).

[5] All subsequent references are to the Cannan edition of *The Wealth of Nations* (New York: Modern Library, 1937).

[6] Once this is granted, it can be said that when labor temporarily receives more wage-goods "it is their [esteem] value which varies, not that of the labour which purchases them" (p. 33). This remark, which has puzzled so many commentators, is perfectly logical in its context.

economy is itself a major element in the improvement of welfare.

Fortunately, the validity of this assumption can be tested by its consequences. The effort-price of income must be expressed in terms of an operational standard of measurement. The first difficulty is that of selecting a representative money wage unit. In the chapter on relative wages (Book I, chapter 10) Smith had shown that, despite differences in the hourly wage rates of different occupations, perfect competition does tend to equalize monetary returns to units of disutility of labor; the market does reduce the various types of labor to a common standard. Therefore, in principle, a representative money wage unit can be constructed.[7] The second difficulty is that of selecting a stable value-coefficient to express real wages. Smith argues that for calendar periods of moderate length a nominal wage unit in terms of silver will prove satisfactory owing to the relative stability in the value of silver "from year to year" and even "for a half a century or a century together" (p. 35). However, for longer periods a corn-wage unit would be more suitable: the price of corn fluctuates sharply in the short run and rarely in the same direction, or with the same amplitude, as money wages (pp. 36, 74, 75, 83, 85) but "from century to century" corn prices are remarkably stable" (pp. 36–7, 477, 482). The reason for this is that cost-reducing improvements in agriculture are "more or less counterbalanced" by the rising price of cattle, "the principal instruments of agriculture" (pp. 187, 219–24, 240). And since corn is "the basic subsistence of the people," the money price of corn governs money wages in the long run: "from century to century, corn is a better measure than silver, because from century to century, equal quantities of corn will command the same quantity of labour more nearly than equal quantities of silver" (pp. 37, 187, 476).[8] The argument is complete: the wage unit in real terms and in money terms, i.e., the wages of common labor measured in corn, is invariant through time and reflects an invariant disutility of labor.

Smith did not doubt that "at all times and places, that is cheap which costs little labour to acquire." And so, as output per man hour rises, the "real prices" of goods should fall relative to corn, meaning they will command less labor. Likewise, the number of wage units commanded by the total product year after year should tend downward. This is reasonable enough since the labor commanded by commodities is the reciprocal of labor's purchasing power over real income. However, this line of reasoning is in direct contradiction to Smith's positive index of subjective welfare. The contradiction is due to the fact that the positive index assumes constant real wages and constant returns to technological progress. Actually, Smith believed that an increase of population would raise output per man by extending the scope of the division of labor; and this tendency alone implies that every addition to output will command less additional wage units. Or, as Ricardo would say, an increase in welfare may mean an increase in "riches" or a fall in "value." An increase of riches is what we would now call 'capital widening,' an increase in output without a change in the capital and labor coefficients. Whereas a fall in value denotes a rise in the average productivity of labor, or, in Smith's language, a fall in the amount of labor commanded per unit of output.

Ricardo dismissed riches per se as irrelevant to economic welfare. This is a defensible position. But both Smith and Ricardo do agree essentially in treating "value" as an inverse index of the average productivity of labor and therefore of economic welfare. Ricardo regards welfare as a matter of minimizing human effort per unit of output while Smith regards it as a matter of maximizing labor's *potential* purchasing power over real income. But Smith's standard, just because it is tied more explicitely to subjective income, rests upon a greater number of dubious

[7] One could object here and argue the the relevant question is whether the wage structure is rigid through time.

[8] The whole of the famous "Digression concerning the Variations of the Value of Silver during the Course of the Four last Centuries" is devoted to justifying the notion of the long run constancy of corn-wages. But it is difficult to know whether this is anything but a simplifying assumption. At one place Smith remarks upon the lack of time series data on money wages in contrast to the regularly recorded series of corn prices. This fact alone, he suggests, forces us to resort to corn prices "not as always exactly in the same proportion as the current prices of labour, but as being the nearest approximation which can commonly be had to that proportion" (p. 38).

assumptions. If, for example, real wages vary through time, the entire argument breaks down. Commodities may command less labor simply because money wages have risen or because prices of wage-goods have fallen. The resulting effect upon investment, and hence upon the trend of wage units commanded by total output, will be very different in the two cases. This difficulty disappears only if both real and money wages tend to remain constant in the long run. This is the source of Ricardo's disagreement with Smith. In Ricardo's system, capital accumulation spells a rising price of corn; real wages remain unaltered but money wages rise with corn prices; this is what causes rents to rise and profits to fall.

"Dr. Smith's error throughout his whole work," Ricardo declared, "lies in supposing that the value of corn is constant."[9] It would have been a simple matter to have shown that Smith's belief in the stability of corn prices "from century to century" is irrelevant to the analyses of such policy measures as the Corn Law of 1815—Ricardo's purpose was, after all less ambitious than Smith's. This Ricardo failed to do. By assuming that Smith was concerned with Ricardian questions, he filled his *Principles* with a series of misguided attacks on Smith's standard.[10] It would take a monograph to unravel Ricardo's criticisms; Malthus's prolix but perverse defense of Smith's measure would provide some entertaining chapters. But we have done with it here.

[9] *Works of David Ricardo*, I, p. 374.

[10] Ricardo's favorite method is to construct a numerical example to show that Smith's measuring rod cannot distinguish between "a rise in the value of labour" and "a fall in the value of things . . . on which wages are expended." A single illustration will suffice to indicate the character of the critique. (*Ibid.*, pp. 19–20; see also pp. 103–4, 306.) Suppose that labor is paid in corn and consumes ½ bushel of corn per week, trading the rest for other goods. Now corn falls in price. Labor receives more corn but yet can buy less of other goods which have not varied in price (despite changes in relative prices, the composition of the market basket remains the same).

Wages in corn	Corn prices per bu.	Money wages	Expend. on corn	Expend. on other goods
1 bu.	80s.	80s.	40s.	40s.
1½ bu.	40s.	50s.	20s.	30s.

In this case, Ricardo alleges, Smith would have to say that labor has risen in value because "his standard is corn, and the labourer receives more corn for a week's labour," whereas he should have said that the value of labor has fallen because labor's real wages have decreased. Obviously, the criticism is unfair. Ricardo ignores the fact that Smith's standard is meant to be employed for long run comparisons, and a huge long run at that. Naturally if the price elasticity of demand for corn is zero and the cross-elasticities of demand for all consumption goods are also zero, a fall in corn prices associated with a fall in money wages may leave the laborer worse off. But what of the repercussions of the fall in real wages? Population growth will slacken, Smith might have replied, the demand for corn will fall off, corn prices will rise, followed by money wages, etc.

V

Properly understood, there is nothing wrong with Smith's labor-standard. It is simply that Smith applied it indiscriminately. Actually, as has been pointed out, modern methods of making international comparisons of economic welfare per head are nothing but applications of Smithian welfare economics. For instance, Soviet living standards may be compared with American living standards by asking how many hours of work, rewarded at the going rate, would be required to buy specific articles at current prices in each of the two countries. This procedure assumes, among other things, that the disutility of labor in the U.S.S.R. is the same as in the U.S.A. Or, real earnings may be compared in terms of a given basket of wage goods valued at constant dollar prices (Colin Clark's International Units), which involves similar assumptions. No one will deny that these methods ought to be supplemented by comparisons of the productivity of labor and of capital—and of personal income distribution, an aspect of welfare which the classical economists completely neglected—before secure pronouncements can be made about economic welfare. As soon as this is understood, the controversy between Ricardo and Smith on the proper "standard of value" takes on the character of so many great battles in intellectual history: a conflict between two poorly expounded half-truths.

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DEMAND CURVES AND PRICE DISCRIMINATION

In his *A Revision of Demand Theory*,[1] Hicks maintains there to be an income effect in the Marshallian Demand Curve.[2] Friedman, however, contends that there is not.[3] Though not stated specifically by either, to deny the presence of an income effect in the Marshallian demand curve is to maintain that this demand curve is equivalent to that of the marginal sums yielded by subjecting the consumer to first-degree or perfect price discrimination. The purpose of the present note is to make this and other relationships more apparent by emphasis upon price discrimination.

The compensated demand curve may be derived by either of two approaches—the price-quantity approach or the quantity-price approach. By the former method reductions in price are accompanied by compensating variations in income which leave the consumer no better off than before the price reductions, so that any increase in quantity as price falls is due solely to the substitution effect.[4] The compensated demand curve becomes thus a special kind of indifference curve with price on the vertical axis and quantity on the horizontal.[5]

The identical[6] curve may be constructed utilizing the quantity-price approach by "... asking, first of all, how much money the consumer would be prepared to give for a first unit of X; then, that amount having been paid for a first unit, how much would be paid for a second; and so on."[7]

When it is constructed by this method Hicks calls the compensated demand curve a *marginal valuation* curve.[8]

The derivation of the marginal valuation curve is clearly equivalent to subjecting the consumer to first-degree or perfect price discrimination—extorting from him a ransom price for each successive unit and confining each decrease in price to the unit under consideration. Thus a demand curve that possesses no income effect must be equivalent to a curve showing the marginal sums yielded when the consumer is subjected to perfect price discrimination.

If one does not view the Marshallian demand curve as equivalent to subjecting the consumer to perfect price discrimination the Marshallian demand curve must lie either above (when the income effect is positive) or below (when the income effect is negative) the compensated demand curve. In other words, whatever Marshall's assumption of a constant marginal utility of money is taken to mean,[9] it cannot mean that there is no income effect in his demand curve—unless it is agreed that Marshall's demand curve is identical with a curve showing the marginal sums that can be extorted from a consumer by forcing him to pay a (different) ransom price for each unit of the good he purchases (in successive transactions).

In Figure 1 MV is a compensated demand curve (which might be more aptly entitled a marginal extortion curve) derived by the quantity-price approach; i.e., equivalent to subjecting the consumer to perfect price discrimination. AV is the average valuation curve (perhaps more aptly entitled the average extortion curve). M is the Marshallian demand curve, assuming the income effect to be positive, and taking Hicks' view of the Marshallian Demand Curve.

The consumer (on Hicks' Marshallian Demand Curve) pays OADQ for the quantity OQ. The amount that he would pay rather than forego the consumption of the commodity is the amount that could be extorted from him by perfect price discrimination or OBCQ. The excess of what he would be willing to pay for OQ rather than go without it over what he actually pays (Marshall definition of consumer's surplus[10]) is thus ABCD.

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[1] J. R. Hicks, *A Revision of Demand Theory* (Oxford: Clarendon Press, 1956).

[2] *Ibid.*, p. 75 ff.

[3] Milton Friedman, "The Marshallian Demand Curve," *Journal of Political Economy*, December 1949, LVII, p. 467; reprinted in Friedman's *Essays in Positive Economics* (Chicago: University of Chicago Press, 1953), p. 54.

[4] J. R. Hicks, *op. cit.*, p. 72 ff. In Hicks' new formulation the substitution effect may be positive *or zero*.

[5] *Ibid.*, p. 74.

[6] The marginal valuation curve is not identical to the compensated demand curve over any range of the commodity during which it yields increasing marginal utility to the consumer. With this possible exception, the two are identical (*ibid.*, pp. 86–87).

[7] *Ibid.*, p. 87.

[8] *Ibid.*, p. 86.

[9] *Principles*, 8th ed., reprinted 1952, p. 693.

[10] *Ibid.*, p. 103.

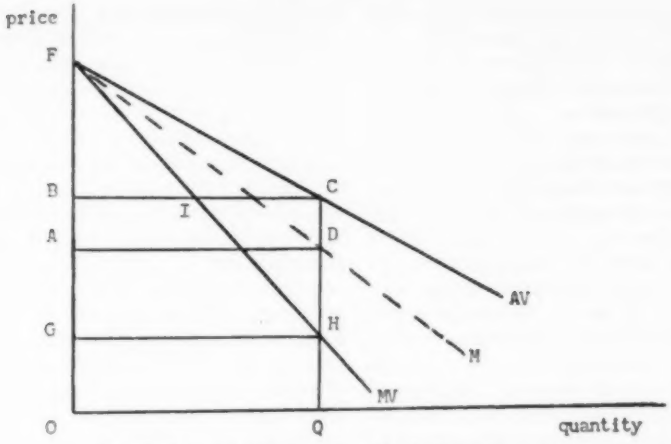

FIG. 1. Interpretations of the Marshallian Demand Curve

This area is *not*, however, equal to the area under the Marshallian demand curve (Hicks' view of the Marshallian demand curve). On the other hand, if Friedman's view of the Marshallian Demand curve is accepted this curve becomes equivalent to the marginal curve yielded by subjecting the consumer to perfect price discrimination, or MV. The consumer's surplus then becomes equal to GBCH or the area under MV (now the same as M), since the triangle BIF is equal in area to the triangle CIH.

Thus, by taking Friedman's view of the Marshallian demand curve the familiar result is obtained that the consumer's surplus may be represented as the area beneath the demand curve (above the price).[11] But by taking this view, it also follows that the Marshallian demand curve is equivalent to the marginal sums yielded by subjecting the consumer to perfect price discrimination. By taking Hick's view the equivalence of the Marshallian demand curve and curve representing the marginal sums yielded by perfect price discrimination no longer holds, but the consumer's surplus may no longer be represented as the area beneath the demand curve (above the price).

Either one of these present-day authorities is wrong, or Marshall himself was inconsistent in his treatment of the demand curve. To the present author it seems probable that Marshall was speaking of an uncompensated demand curve in Chapter III of Book III,[12] and that he was speaking of a compensated demand curve in Chapter VI of Book III[13] without perhaps realizing that the two were not the same.

From the diagram above it is apparent that what the typical consumer stands to lose from being subjected to perfect price discrimination depends upon the relative inferiority of the good. Assuming M now to be a normal demand curve indisputably possessing an income and a substitution effect, if the income effect is positive, M will lie above MV, and the consumer will have to pay an additional amount (less than GBCH) if he is suddenly subjected to perfect price discrimination and continues to purchase OQ. If the income effect is negative, M will be below MV and the consumer will have to pay an additional amount (greater than GBCH) if he is suddenly subjected to perfect price discrimination and continues to purchase OQ.

If there is no income effect, subjecting the consumer to the most severe price discrimination possible—perfect or first-degree price discrimination—causes him to lose the consumer's surplus represented by the triangle FGH if he continues to purchase OQ. Not subjecting him to price discrimination permits him to retain this area, while subjecting him to types of price discrimination less severe than first-degree permits him to retain portions of his consumer's surplus that can

[11] *Ibid.*, p. 106.

[12] *Ibid.*, pp. 78–85.

[13] *Ibid.*, pp. 103–114.

be represented by triangles of lesser area than FGH. An ordering of types of price discrimination by the amount of consumer's surplus retained can be conceived as yielding a sequence of triangles with the common side HG and a right angle at G but possessing greater and greater areas as the severity of the price discrimination declines. The apexes of the triangles representing the consumer's surplus retained would thus rise from G toward F as the consumer was subjected to price discrimination of lessening severity.

Alternatively (retaining the assumption of no income effect) FGH can be thought of as the base of a three-dimensional structure extending in the plane perpendicular to that of the price and quantitiy axes. Sections of this structure when taken parallel to the plane of the price and quantity axes yield the triangles of the preceding paragraph. Price discrimination of increasing severity can thus be represented by moving an increasing distance perpendicular to the plane of the price and quantity axes, and the consequently decreasing consumer's surplus retained can be represented by the decreasing area of the sections taken in planes parallel to that of the price and quantity axes.[14]

As measures of the severity of price discrimination the ordinary "degrees" of price discrimination are not sufficient to indicate the extent of the consumer's surplus retained. Obviously relevant are the number of different prices at which the consumer is induced to purchase portions of OQ, the disparity between these prices and OG, and the proportion of OQ purchased at each price. If, for example, the consumer was induced to pay three prices only slightly different from OG for the number of units comprising OQ, he would lose little of his consumer's surplus. Or, if only one of the three prices was significantly above OG and he purchased only a very small amount at this price, he would lose little of his consumer's surplus. Yet, if the consumer is subjected to third-degree price discrimination, for example, this alone specifies no unique number of prices that he must be charged or proportionality between these prices or the proportion of OQ purchased at each price, and is consequently an inadequate measure of the severity of price discrimination.

In summary, whether there is or is not an income effect in the Marshallian demand curve is a matter of dispute. If this curve has no income effect it becomes equivalent to the marginal sums yielded under perfect price discrimination and is thus considerably different from the conventional demand curve. If it *does* have an income effect, however, Marshall's notion of consumer surplus as the area under the demand curve is incorrect. In a normal demand curve, indisputably possessing an income and a substitution effect, the loss to the consumer resulting from his subjection to price discrimination depends upon the severity of the price discrimination and the relative inferiority of the good.

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[14] Since the severity of price discrimination could not exceed that of first-degree price discrimination, movement perpendicular to the plane of the price and quantity axes could not extend beyond that distance corresponding to first-degree price discrimination. I am indebted to Mr. Robert Kelly for the basic concept of the three-dimensional structure.

ON THE SOVEREIGNTY OF CONSUMER, CITIZEN AND STOCKHOLDER

This note deals with the nature and forms of buyer sovereignty, and conditions for attaining it. My objectives will be: (1) to generalize the issue of consumer sovereignty to the problems of (a) citizen, and (b) stockholder sovereignty; and (2) to make explicit one set of conditions sufficient for the achievement of the sovereignty of these groups.

It has been recognized by some writers on public finance that no market mechanism exists by which citizen-consumers can register their preferences for "collective consumption goods," such as public-health activities, highways, fire and police services.[1] Consequently, the desires (demands) of citizens may go unsatisfied; in other words, with respect to "collective goods," the citizen may not be sovereign. It has also been noted that, with the growth of large corporations, there has been a separation of ownership from

[1] For example, see Paul A. Samuelson, "The Pure Theory of Public Expenditures," *Review of Economics and Statistics*, Nov. 1954, XXXVII, and

control. Stockholders may not control what they own;[3] the stockholder may not be sovereign.

In general, in any buyer-supplier relationship —consumer-producer, citizen-government, stockholder-management[5]—two conditions are sufficient for buyer sovereignty to exist: (1) Numerous alternatives must be available to buyers; (2) Making changes (switching sources of supply) must be easy for buyers.

These conditions, while "sufficient," are not "necessary" for the achievement of buyer sovereignty. It is, of course, possible for buyers' demands to be realized if each supplier would cater to the preferences of his customers, even when those preferences changed. Then, buyers would have no motive to change supply sources, and the availability of alternatives as well as the ease with which buyers could make changes would be irrelevant.

It is important to note that for buyer sovereignty to exist there is no requirement that all suppliers vie for all buyers, but only that some suppliers vie for (or, at least, meet the preferences of) each buyer. Without making this latter point explicit, Charles M. Tiebout apparently recognized it in arguing that preferences of the citizen-consumer *are* met (i.e., in our terms, the citizen is sovereign) with respect to those collective goods which are supplied by local (and, to a lesser degree, by state) governments:

> Given these [more or less set] revenue and expenditure patterns [of local government units], the consumer-voter moves to that community whose local government best satisfies his set of preferences. The greater the number of communities and the greater the variance among them, the closer the consumer will come to fully realizing his preference position.[4]

Thus, for citizen sovereignty to be achieved, it is not necessary that local governments alter their behavior patterns; citizens may adjust to the fixed patterns of governments by moving (i.e., by switching supply sources). This is in contrast to the notion that the attainment of consumer sovereignty is a process of adjustment by producers to the fixed preference patterns of consumers. The adjustment by consumers is an equally effective alternative—provided that the two conditions listed above are met.

In the stockholder-corporation relationship we have an analogue to that of the citizen-community relationship. Again, we have been accustomed to think of the path to stockholder "sovereignty" (i.e., satisfaction of preferences) as involving the adjustment by each corporation to the preferences of its stockholders. However, we must recognize once more the alternative path—in this case, the switching by stockholders among corporations—the adjustment by stockholders to the often-fixed behavior patterns of corporations. Again, this will be an effective route to the objective of satisfaction of stockholder preferences—provided that the two conditions are met. It may be added that achieving buyer satisfaction (sovereignty) in this way is not necessarily less effective than the alternative by which particular suppliers would alter their policies.

In the three buyer-supplier relationships we are considering (consumer-producer, citizen-local government, stockholder-corporation), the two sufficient conditions for buyer sovereignty are fulfilled in varying degrees.

Consumer-producer: Condition 2, ease for consumers of changing supply sources, would, in general, hold to the degree that condition 1 holds, for this involves the extent to which industry is competitive, and alternative supply-sources exist. The ease of changing sources of supply is a positive function of the number of competitors. It would seem that for retail trade, particularly in urban areas, conditions 1 and 2 are fulfilled to a substantial degree.

Citizen-local government: There is little doubt that the many thousands of local government units in the United States provide a very wide variety of alternative bundles of services, so that condition 1 is adequately met. But we cannot assume that it is easy for people to switch between communities; moving is frequently costly, psychologically as well as financially. Thus, con-

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"Diagrammatic Exposition of a Pure Theory of Public Expenditures," *ibid.*, Nov. 1955, XXXVIII, and William J. Baumol, *Welfare Economics and the Theory of the State* (Cambridge, Mass.: Harvard University Press, 1952), p. 15 ff.

[3] "In almost no particular is he [the stockholder] in a position to demand that they [the managers] do or refrain from doing any given thing." Adolph A. Berle, Jr. and Gardiner C. Means in *The Modern Corporation and Private Property* (New York: The Macmillan Company, 1934), p. 277.

[5] Stockholders are the "buyers" of the earnings, dividends, growth, liquidity, etc., of corporations, with managements being viewed as the "suppliers" of these corporate characteristics.

[4] "A Pure Theory of Local Expenditures," *Journal of Political Economy*, Oct. 1956, LXIV, p. 418.

dition 2 may be poorly satisfied, the difficulty of citizens changing communities often being great.[5]

Stockholder-corporation: Clearly, there are corporations with a wide variety and numerous combinations of earnings records, dividend policies, growth patterns, sales stability, liquidity positions and other characteristics relevant to stockholders.[6] Stockholders' alternatives are, indeed, vast in number; condition 1 is largely fulfilled. And, with our well-organized security markets it would seem to be relatively easy for a dissatisfied stockholder to switch his stock holdings to a corporation the behavioral characteristics of which more nearly satisfied his preferences. Actually, the "cost" of switching stock holdings (condition 2) involves, aside from brokerage charges, the individual's subjective evaluation of the terms at which the switch may be made (i.e., the relative prices of the stock held and the stock desired). And, of course, the actual market prices of these securities will depend upon their evaluation by stockholders in general. Depending upon these market values, the cost of switching (in terms of the sacrifice made) will be positive, negative, or zero for any particular person.

In all of the above cases, the point to be observed is, simply, that the satisfaction of the preferences of buyers (whether consumers, citizens, or stockholders)—the achievement of buyers' sovereignty, in other words—is achievable by buyers switching among alternative suppliers; and, insofar as our two conditions hold, buyers *will* adjust and obtain their preferences, regardless of the responsiveness of particular suppliers. We need not think of buyers' sovereignty as being attainable only via the adjustment of each supplier to the preferences of its "customers."

It is certainly true that there are costs to be borne if the changing desires of buyers are to be catered to, though the location of the burden of these costs will differ, depending on who does the adjusting. If buyers seek new supply sources, they incur costs (of transportation, moving, brokers' fees, etc.); but the costs (of reorganization and change) are borne by suppliers when they alter their policies to meet the changing desires of their current customers, citizens, or stockholders. There are real costs associated with change, but until welfare economics develops a basis for determining how the costs ought to be divided, we cannot say which of the paths to "buyer sovereignty" is preferred. We may get there either way.

BURTON A. WEISBROD
Washington University

[5] In his simplified, polar model, Tiebout assumed away our condition 2 with the statement, "consumer-voters are fully mobile and will move to that community where their preference patterns, which are set, are best satisfied." (Tiebout, *op. cit.*, p. 419.) Costs of "transport," in broad terms, were assumed to be absent; or, alternatively, people were assumed to be moving for other reasons, their decisions with respect to a particular location depending upon the available constellations of public goods relative to their wants.

[6] And, over time, these combinations are not fixed, either for a firm or in the aggregate, even though changes may not be the consequence of stockholder preferences. The proxy fight of a few years ago for control of Montgomery Wards failed; yet, recent decisions by the Board of Directors have changed the company into an aggressive, expansionist firm.

BOOK REVIEWS

The Foundations of Capitalism. By Oliver C. Cox. New York: Philosophical Library, 1959. Pp. 500. $7.50.

Stepping forthrightly into an area of study heavily laden with controversy, yet taking little cognizance of the differing points of view already heatedly advanced, attacked, and defended, Professor Cox has presented a coherent and intriguing account of early capitalist evolution. Indeed so coherent and intriguing is this work that the reader's initial annoyance at the absence of explicit checkpoints with respect to longstanding disagreements, is almost balanced by his admiration for the scholar who simply presents his own findings knowing full well that latent vested interests will shortly rise to strike him down.

On further reflection, moreover, reader annoyance even begins to soften before a sobering second thought. In one sense, at least, this book is clearly a step removed from the frame of reference of much earlier discussion.

For example, the Max Webers may argue that capitalism grew directly out of post-Reformation Protestantism, the H. M. Robertsons may assert that capitalist evolution does not correlate closely with the repudiation of Catholicism, the R. H. Tawneys may present the eclectic view of a totally new kind of civilization emerging out of the breakdown of mediaevalism, and the Karl Marxs may see the rise of capitalism as a particular kind of evolution of property relationships. But all of these points of view essentially agree on one point: the birth of capitalism had as its setting the decline of feudalism in the 13th, 14th, and 15th centuries.

Professor Cox, on the other hand, does not at all take this period as his starting point. He dates the origin of capitalism from, say, the year 568—the "year Alboin and his Lombards invaded Italy from Pannonia" (p. 31). Once again inhabitants of ruined cities to the North sought refuge from barbarian hordes in the estuary later developed as the City of Venice, and "this time they resolved to stay there" (p. 31). In other words, side by side with the evolution of feudalism as a society-type, and indeed even set in motion by the same underlying cause, capitalism began a development that has been of substantially longer duration than is commonly supposed. Thus when Holland, and then England, and then the United States developed the national capitalism of more recent times, there was amazingly little real innovating to be done.

As is perhaps suggested by this illustration the basic methodology of this work is parallelism. Professor Cox first arrived at a working definition of capitalism:

> Let us, then, at this early juncture, attempt to say what we mean by capitalism. As a form of social organization, capitalism is constituted elementally by a peculiar economic order, government, and religious structure; and these, although mutually indispensable, are yet related to each other in descending order of importance. Economically, capitalism tends to form a system or network of national and territorial units bound together by commercial and exploitative relationships in such a way that a capitalist nation is inconceivable outside this capitalist system. A body of international law and traditional rules, weighted in favor of the most powerful nations, are developed and promulgated to regulate the system (pp. 15–16).

A second step was to find the social system which first, in the chronological sense, exhibited all of these characteristics. The bulk of his book is then devoted to demonstrating how closely later capitalist systems corresponded to this model.

In this respect, the procedure here is very much akin to Toynbee's in *A Study of History*. Furthermore, there is another key similarity between these two studies. A favorite Toynbee theme is "challenge and response." Professor Cox, too, casts much of his thinking into this framework—to such a degree, in fact, that it comes to the reader as something of a surprise that *A Study of History* is not included in Cox's bibliography. Note in this connection the following passages:

> The new situation [the Venetians driven to the lagoons] actually called for all the imagination and ingenuity that these educated classes could afford. They could not continue their old way of life with agriculture as its base; there were few traditions to guide them; even the physical structure of the community had to be built from the ground up (p. 31).

But the challenge must not be too great:

> Venice was situated in an interstitial power zone, at the unstable margins between the conquering

but relatively uncultured Lombard Lords in Italy and the Eastern Roman Empire with its seat at Constantinople (p. 32).

> They [cities such as Venice] succeeded in a very high degree to isolate themselves from feudalism and to develop a distinct system of law and economic order. Thus, the stronger the feudal lord and the more uninterrupted his dominion, the greater was the difficulty of organizing national-capitalist cities. The French and English cities, caught up in the stream of developing capitalism, remained relatively dependent and subject particularly because of the settled state of their feudal overlordships (p. 27).

And what have been the principal recurring features of capitalist societies? Professor Cox lists the crucial trait of capitalist government as "elected, controlled leadership" (p. 41)—that is, democracy, even though the electorate may be actually a narrow oligarchy. Dominant capitalist attitudes he found to include nationalism as "an integrating force absent in feudalism and significantly distinguishable from the patriotism of the ancient cities" (p. 55), "a constant necessity for and drive toward a national church, or at least a church unmastered by a foreign power" (p. 57), and foreign commerce as "the real business of life about which an effective social organization was fashioned" (p. 62). On the side of culture it was concluded that capitalist societies are invariably characterized by such things as popularization of learning, a humanitarianism that seeks outlet in welfare institutions, a pattern of social status based upon economic individualism, an elaborate communication mechanism, a tendency to conceive of themselves as miraculous and wonderful, and a deep capacity for cultural assimilation.

Building on this framework of parallelism and challenge and response, Professor Cox traces the development of capitalism as far as the preëminence of England. From the single city of Venice the scepter passed to a union of cities (The Hanseatic League), then to Amsterdam where capitalism began to be transformed from a city phenomenon into a national type of organization, finally becoming a full-fledged national capitalism in England. In all of these situations essentially the same pattern was found to be almost monotonously repeated, with imaginative (though typically documented) and thought-provoking reasons given for such differences as did develop between these several capitalist societies.

The Foundations of Capitalism is well worth the time of anyone interested in the problem with which it deals, and it seems safe to say that that problem can not now be seriously discussed without taking into account Professor Cox's study. It is the author's intention, furthermore, to follow up this volume with two others treating other aspects of capitalist development—especially American capitalism. This reviewer, for one, will be very much interested in these volumes when they appear, although he will meanwhile hope that printing errors will be less numerous in these projected studies.

HOWARD R. SMITH
University of Georgia

Policy Against Inflation. By R. F. Harrod. New York: St. Martin's Press, 1958. Pp. xii, 257. $4.75.

This manual of monetary management to prevent inflation was prepared by the well-known English economist-author in 1957. It was written for the popular reader and discusses primarily the rules to be used as applied to the economy of Great Britain. A brief historical review of monetary events in the nineteenth century gives the reader the proper background to understand the chief contributions of the author. A reader in this country must have some training in economic theory in order to grasp the full significance of the analysis and conclusions presented.

The chapters are arranged to follow in chronological order the period of the gold standard to 1922 and the years under managed currency which followed. An excellent review of Keynes' ideas on monetary policy precedes chapters on war finance and post-war problems after 1945. The origin of the present popular analyses of cost-push and demand-pull types of inflation is presented. The student of English monetary history will find an excellent introduction to the recent events there. A concluding chapter presents the rules of management of money which he proposes.

Mr. Harrod proposes that the general objective of policy is "maintenance of demand at a level that ensures comfortably full employment and the steady growth of output in accordance with the potential of the economy." Criteria proposed for efficient regulation of policy are unemploy-

ment and the "rise and fall in current orders." It is recommended that some reference should be made to productivity per person and balance between the main sectors of the economy. These criteria are to be applied in the light of some preconceived idea of the proper rate of growth, and price level data is to be used with caution.

The tools of policy preferred in this volume are changes in money supply through control of interest rates rather than by fiscal policy. The lack of proper statistics for use in such control is casually mentioned and too little explanation is offered of the problems of inducing deflation. The writing style of the author is pleasant, and meanings are generally clear. The present reviewer has a limited understanding of the special situation in the English economy, but he is tempted to propose a new title for a book on monetary management in the United States. It should be called, "*Monetary Policy Promotes Inflation.*"

CECIL C. CARPENTER
University of Kentucky

The Income of Nations: Theory, Measurement and Analysis: Past and Present. By Paul Studenski. New York: New York University Press, 1958. Pp. xxii, 554. $25.00.

Professor Studenski's book is an extensive examination of the cosmopolitan origin, development and current status of national income concepts, measurements and analysis. The work is divided into four major parts: (1) History, (2) Theory and Methodology, (3) Estimates for Selected Countries and (4) Developments in Sixty-Six other Countries.

Part one, especially, fills a recognized need. It makes coherent the origins of the national income concept, especially in England and France. In these pages Sir William Petty and Gregory King in England and Pierre le Pesant Sieur de Boisguillebert and Seigneur Sébastien le Prestre de Vauban in France receive credit as originators of the comprehensive production concept that dominates the field in free enterprise economies today. On the other hand, Adam Smith's

> introduction of the restricted material production concept, in the light of the influence it exerted over the next century, can be said to have been a serious interruption in the logical development of economic analysis . . . and to have retarded the growth of national income theory and practice.

Moreover, this concept (that only material goods are evidence of production) after virtual extinction by the mid-nineteenth century, was suddenly revived in a perverse and unexpected form by Karl Marx in his socialist theory.

The historical section contains much of interest on the origins of estimates in many countries. For example, the first estimates for the United States were made in 1843 by a professor of moral philosophy at the University of Virginia, George Tucker. The first official estimates in any country, on the other hand, were prepared by Timothy A. Coghlan in 1886 for Australia. Even for the period since World War II, Studenski's summary is a useful, though admittedly not definitive, overview of developments too close at hand to afford easy perspective. In a relatively short section are summarized the forces that have influenced the developments in this field in the last three hundred years. This list of important factors starts with the "Interest and Initiative of Individual Scholars" and ends with the "Influence of International Organization."

In Part two on theory and methodology, Studenski features the three-fold nature of good estimates as comprehending production, distribution and disposition of income. There is also a consideration of some on-going issues in the field such as final versus intermediate products in the market economy and the proper treatment of government. The coming of various aggregates and the social accounts as an amplification of the older estimates of national income alone, is examined. On this point Studenski says,

> There can be no doubt that the social accounting approach is here to stay. At the same time, it is probably still much too early to define the exact nature and extent of the contribution it is likely to make to national income analysis.

A chapter on intertemporal and international comparisons suggests both the dangers and the opportunities in this vast and potentially rich field. Part two concludes with a set of four chapters on estimating methods which feature the net output method, the income distributed method and the expenditure or final products method and numerous of their sub-variants.

In part three we are offered a detailed individual review of procedures in thirteen countries currently making estimates in order to provide insight into the circumstances, difficulties and creative ingenuities of various estimating procedures. These reviews encompass a variety of

countries in terms of culture, level of economic development and economic organization. Since the author has commented on them elsewhere in the book and since information about them is readily obtainable, the United States and the United Kingdom are omitted from detailed review. In contrast, the most extensive review of all is given to Soviet Russia's estimates in this section "because of the importance of the country and because of the interesting nature and general inaccessibility of the original materials."

The fourth and last part deals with developments in sixty-six other countries in a much less detailed fashion. Concerning the estimates of the United States we read that by 1954 they

> had become among the most distinguished in the world for the extraordinary richness of their underlying statistics and the consistency and refinement of their underlying techniques as well as for their wide scope and detail.

In this, as in previous sections, bibliographical references help the reader pursue particular topics for particular countries.

A statistical appendix summarizes the principal national income aggregates (domestic output at factor cost, national income at factor cost and gross national product at market price) for 87 countries in 1955. This appendix, together with the sources it cites, provides the basis for several analytical tables in the text itself concerned with actual international comparisons. Footnotes are presented in a separate section following the statistical appendix. An index of authors and a separate index of countries and regions adds much to the utility of so large a volume.

The author indicates that this book has been underway parallel to an already fully scheduled teaching and research career since the middle 1930's. Numerous interruptions necessitated repeated recasting of the manuscript to encompass newer developments. This process, while delaying publication, has undoubtedly enriched the work.

This book is an essential part of the library of anyone concerned with the intellectual roots and present practice of national income analysis. It offers a rapid orientation to an exceedingly complex and extensive historical and geographical terrain. It will become a long standing reference point in this highly significant field of applied economics and statistics.

LOWELL D. ASHBY
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Economic Synthesis. By Boris Ischboldin. New Delhi: New Book Society of India, 1958. Pp. 543. $6.00.

Dr. Ischboldin has set for himself an ambitious task in his effort to combine the varied strands of economic theory. At the same time, while striving to achieve this major goal, he has kept firmly in mind two pragmatic purposes. First, he is concerned with revitalizing what he terms analytical social economies, i.e., the logical method employed by literary economists in contrast with the "esoteric" method of mathematical economists and econometricians. Secondly, as he states in the preface, he has tried to effect some reconciliation between neo-classicism and Keynesian thought.

The plan of the book follows rather closely the conventional organization to be found in the majority of textbooks in economics, *en tout cas*, down to the nineteen fifties. The twelve chapters in Part I treat the scope of economic science, production, consumption and saving, value and price under free competition and monopolistic conditions and statics and dynamics. The treatment in Part II covers national income, the returns to factors, credit, the socio-economic balance sheet, social rent and the theory of economic laws and methodology.

Emphasis is placed on the fact that there can be no dynamic economic theory which is devoid of a given social environment. Economics must assume a given market structure even when the analysis involves such technical topics as demand, supply and prices. It can never be a purely naturalistic science. Thus it is dialectical in nature and the "econometric (i.e., mechanical and quantitative) approach, which is now in vogue, cannot alone build up economic theory even in its most elementary form" (p. 18).

In the chapter on Value and Valuation the author argues (buttressed by a series of examples) that the theory of indifference curves devised by Edgeworth, Pareto, Hicks and Allen is of restricted importance and serves at best to supplement the theory of marginal utility. It is simply an "off-shoot" of the theory of subjective value. The marginal rate of substitution implies a comparison of the marginal utility of one good in terms of another good for which it is substituted —i.e., the last increment of one good being estimated in terms of another (p. 142).

It is difficult to interpret the author's attempt

to devise a synthesis between neoclassical economics and Keynesian doctrine. In the chapter on Interest he accepts the existence of liquidity preference, but states that in a modern economy, under normal conditions, it is merely a minor cause of interest (p. 409), and even under extreme conditions it is never the sole cause. The chief defect of the Keynesian theory is in regarding it as only a monetary phenomenon, neglecting the fact that real capital in the form of physical assets is "technically productive." Interest cannot be separated from the sphere of production. Furthermore, interest will occur as a real cost in a stationary economy because capital must be reproduced. There is also a decisive relationship between the interest rate on loanable funds and the marginal efficiency of capital.

On the other hand, the author is in sympathy with those who oppose the neoclassicists by contending that there may be a disequilibrium in the economy between total outlay to the factors of production and aggregate effective demand. His own position rests on the technical point that it is not a disequilibrium between total income and total spending power that gives rise to periodic recessions under capitalism, but the immobilization of a portion of money incomes (p. 465). A defect in the Keynesian analysis is its introduction of the problem of full employment and expectation of government action. But the author is convinced that some new creative myth in place of the "invisible hand" is needed in order to save mature capitalism. Perhaps that myth is social security.

Dr. Ischboldin has contributed many fruitful ideas, new insights and challenging suggestions. He has brought to the attention of English-speaking readers a number of European economists whose writings are little known. His book contains certain defects, the gravest of which is his tendency to lump together indiscriminately an array of names of economists, great and small, without specific reference to their works. The omission of an index is vexing. The bibliography should have been placed at the end rather than at the beginning. Yet the book will be found to contain many rewards for the reader who patiently follows through the subtle distinctions of Dr. Ischboldin's analyses.

TIPTON R. SNAVELY
University of Virginia

The Fertilizer Industry: Study of an Imperfect Market. By Jesse W. Markham. Nashville, Tenn.: Vanderbilt University Press, 1958. Pp. 249. $6.00.

This fact-filled meticulous monograph on the commercial fertilizer industry adds another link to the growing chain of investigations of limited competition. Anti-trust policy and what the author chooses to call positive fertilizer policy form the nucleus of the study. Specifically, why is there so much "sand" in the farmers' fertilizer?

Phosphate rock is combined with sulphuric acid to form superphosphates; to this is added nitrogen and potash. In varying combinations and strengths these three ingredients constitute the nutrient portion of nearly all the mixed fertilizers sold in this country. The ingredients are produced, for the most part, under oligopolistic conditions; the mixed fertilizers are produced and sold both by the large integrated firms and by a host of little ones which market their own mixes. The mixed-fertilizer market is characterized by lack of concentration and ample opportunity for consumer choice.

The phosphate rock and superphosphate, sulphur, potash, and nitrogen industries are examined historically for evidences of monopoly and collusion. There have been plenty of both. Though not as interesting reading as the later chapters, this section demonstrates once again what even reasonably vigorous anti-trust action can do to protect the public against cartels, price agreements and other forms of "administered" prices. Several *nolo contendere* pleas and consent decrees attest the success of the federal government's efforts. Care is taken not to draw hard and fast conclusions where the evidence will support only *prima facie* cases that the producers and sellers had restrained trade through price fixing and other agreements. Even where the evidence of monopoly profits seemed irrefutable the author points to the difficulty of distinguishing monopoly profits from rents and the profits resulting from market frictions.

High-nutrient fertilizers are cheaper to produce and distribute than those of low nutrient containing much "filler," but ignorance and tradition have prevented farmers from demanding the high-potency products. It is in this area of positive policy that much remains to be done by the Department of Agriculture, the experiment stations, the county agents, and the state in-

spectors and examiners of fertilizer products. The chapters devoted to this problem offer many interesting side-lights on the Agricultural Conservation Program, Tennessee Valley Authority, co-operatives, county agents, and state fertilizer control boards.

The only confusing editorial slip detected, appeared to be "little" for "much," page 232, line 6.

RODMAN SULLIVAN
University of Kentucky

Money, Credit, and Public Policy. By Lawrence Smith. Boston, Mass.: Houghton Mifflin Company, 1959. Pp. ix, 757. $6.75.

There are many textbooks in Money and Banking, each a little different but all covering basically the same material. All are written by competent men and are good, the exceptional one being the very one which covers and presents well the material you think should be covered and leaves out the extraneous material which, in another text, causes a different instructor to think that text excellent.

Mr. Smith has added another good text to the field; an excellent one if you like his approach. His book is divided into five parts: An Introduction To Money; Monetary Systems and the Standard; Monetary Experience: Past and Present; Credit and Commercial Banking; and, Money and the Functioning of the Economy.

Rather than comment on the traditional treatment of the traditional material, the reviewer has decided to give you his impressions of the book and the author's abilities as gleaned from periodic reading of the book over a two-month period.

First of all, Mr. Smith is a lucid writer. His explanations are far above average, a good example being Chapter 16 which deals with international monetary problems since 1945 and its section on the devaluations of 1949. Second, Mr. Smith has an historical bent which makes the book very interesting to read and places details in their proper perspective. He loves to stick in interesting quotations and basic source material, such as excerpts from speeches by Roosevelt, to enliven the chapters for the students. His strongest chapters are those where historical treatment is the most appropriate method. Examples are his chapters on American monetary experience (Chapters 12, 13 and 14) and Federal Reserve policy (Chapters 26 and 27). Third, Mr. Smith is sound in his theoretical discussions. He is very thorough and very objective, never taking sides on controversial issues but instead giving the pros and cons of each position. As an example in Chapter 36, "Money and Economic Fluctuations in the Past Quarter Century," he seems to go overboard on Hansen's stagnation thesis in the explanation of the 1930's but then gives the various counter arguments and ends by presenting Schumpeter's complaint that the depression was deepened by the entrepreneurs' reactions to the legislation and social atmosphere created by those who adopted the stagnation thesis.

Further observations which are not so favorable to the author and the book, based on the reviewer's prejudices, follow. The author is so objective at times that the effectiveness of a discussion is diminished. That is, for every ten schools of thought on a topic, listed in order, there are a dozen schools of thought to the contrary, listed in order. Perhaps this is a small price for objectivity and thoroughness.

Second, it is not until the fourth part of a five-part book that the commercial banking system is explained. Just prior to that you have a history of monetary experience in this country. The question is whether students understand financial history without first having mastered the ways commercial banks create and destroy money, especially when government finance is concerned. This objection could, of course, be overcome by covering Part Four first.

Third, as one reads Part Five he wonders if he isn't reading a text in Business Cycles. This, presumably, is the way the author intends to differentiate his book from most books in Money and Banking. Chapter 33 takes up the theories of Raguet and Hawtrey; Chapter 34, those of Schumpeter and Pigou; Chapter 35, Keynes and Mitchell; Chapter 36, Hansen; climaxed by Chapter 37, the last one, with a note of optimism for the future if we handle our money right. On the other hand, the coverage of monetary theory is less than in a number of other texts.

To do a proper book review, it seems that one has to be "a little picayunish" so the reviewer will have to disagree with the author that Keynes would have said the rise in interest rates would have reduced the marginal efficiency of capital (p. 710); or that the height of the price level doesn't matter so long as it's stable, provided the economy has had time to adjust to the given

level (p. 737); or that if the price level in a country is twice as high now as fifty years ago it is not a matter of great significance (p. 54).

In conclusion, the reviewer was favorably impressed by the book as a text for a two-semester course. It should get a favorable reception and will be used by professors, even where it isn't adopted, as a source book for historical material, for the writer has done a tremendous job of assimilating interesting and pertinent material. Any professor who prefers this type of approach will find the book outstanding.

JOSEPH A. GREENE, JR.
Mississippi Southern College

Economic Development of Communist China: An Appraisal of the First Five Years of Industrialization. By Choh-Ming Li. Berkeley, Calif.: University of California Press, 1959. Pp. xvi, 284. $7.50.

This book is an attempt to present a comprehensive economic picture of Communist China during the years of her First Five Year Plan, 1953–57. The scope of this volume is very broad. It covers such varied topics as industrial development and location, agricultural production and collectivization, net capital formation, government budget and taxation, money supply and inflation, Soviet aid, international balance of payments and the export drive. Besides, it contains an estimate of the national income account during those years. There are 48 tables in the text, plus 36 more in a Statistical Appendix, forming a very impressive collection of statistics indeed.

The reader cannot avoid the impression that tremendous effort lies behind the preparation of this volume. This is not only because of the wide range of topics covered, but also due to the fragmentary nature of the available source material. This study is based almost entirely on statistics published in mainland China. Although the author detects no deliberate fabrication of data, many difficulties are encountered in the use of such statistics: sometimes a time series is not given on a continuous basis, frequently statistical concepts are not clearly defined in the source material, and, ironically, the gradual improvement in the statistical coverage also causes further complication by making the data of early years and later years incomparable with each other. Therefore, the construction of a meaningful account from the incomplete available information requires a great deal of sifting and fitting of the published data, in a manner familiar to all crossword-puzzle fans.

The author, however, has exercised considerable care in appraising the reliability of the source data, testing their mutual consistency, and evaluating the extent of the possible over- and under-statement in the statistics. As a matter of fact, the greater part of the text consists of such evaluation and appraisal of data, and consequently numerical figures are not only found in the tables, but are profusely interspersed with words throughout the volume. Thus, by its very nature, this book is no easy reading, despite the fluency and clarity in the author's writing. Wading through statistics, especially in table after table, can be tedious even for an interested person; this reviewer, for one, would have welcomed the use of charts in place of at least some of the tables.

The treatment of most topics is very thorough. Occasionally the author overdoes it by taking some unnecessary steps in the derivation of his estimates. For example, after getting the figures of "gross value of producer goods" and "gross value of consumer goods" in factory production for the two years 1953 and 1956, and also the "net value of total factory product" in these two years, the author sets up two simultaneous equations to derive the ratio of net to gross value product of producer-goods industry and a similar ratio for the consumer-goods industry (p. 89) —only to discard his solutions in favor of the ready figures cited in a Chinese publication (p. 90). One may wonder why the simultaneous equations are used at all, especially since that method is inappropriate anyway unless the desired net/gross ratios in 1953 and in 1956 are known to be identical.

Again, in the estimation of the conversion rate between the ruble and the yuan (Chinese currency unit) in the budgetary valuation of Soviet loans, the author calculates a "precise" rate (p. 173) only after devoting a page and half to the estimation of some admittedly less precise rate figures.

Flaws like these, however, are relatively minor and should not detract from the value of the book. Through this study, the author is making a real contribution to the understanding of the various aspects of the economy of Communist China. His estimation of the national account

(chap. iv) is especially interesting. Without doubt this volume should have a place on the bookshelf of anyone seriously interested in this field.

ALPHA C. CHIANG
Denison University

Raw Materials: A Study of American Policy. By Percy W. Bidwell. New York: Harper & Brothers, 1958. Pp. xvi, 403. $5.95.

This book, published for the Council on Foreign Relations, was placed on my desk shortly after an adverse review had appeared in March, 1959. This review concluded: "One needs only to relabel the book and restate its objectives in order to welcome it as a real contribution to the contemporary literature on raw materials."

The objectives of *Raw Materials* are to present: in Chapter 1, the problems of national policy; in Chapter 2, three types of policy—land laws, tariff protection and tax incentives—initiated before World War I in an era characterized by peace and self-sufficiency; in Chapter 3, a description and evaluation of policies for national security undertaken during World War II and in the Korean struggle; in Chapters 4 through 10, a series of case studies in national policies for lead and zinc, copper, nickel, iron and steel, wool, rubber, and oil; and finally in Chapter 11, recommended reforms in national policy.

All these objectives Bidwell achieves in a clear and scholarly fashion in *Raw Materials—A Study of American Policy*. Why quibble about the "label"? A minor suggestion might be that the subtitle should be *A Study of United States Policy*. However, inside the book all references are in terms of national policy. Here a point of clarification is needed to indicate that national policy includes consideration of both the domestic and international interests of the United States.

Bidwell shows conclusively that the United States:

1. Failed to adapt policy measures affecting supplies of raw materials to the changed economic conditions which have made this country increasingly dependent on outside sources.

2. Failed to bring raw materials policies into agreement with the changed position of the United States in world affairs and with changes in our foreign policy.

These failures are attributed to certain characteristic defects of the democratic process which affect United States policy:

1. The dead weight of tradition shows the adaptation of policies to changed economic conditions and to the changed position of the United States in international affairs.

2. More important than tradition, well organized special and local interest groups have brought pressure to bear on Congress so that domestic interests have triumphed time and time again over national interests.

There are several minor points in use of nomenclature, conclusions and policy recommendations with which this reviewer does not agree, but this is to be expected in a book of this nature and thus does not detract from its merit. Most remarkable are the broad areas of agreement.

The reforms in national policy recommended by Bidwell all lie within the area of "geoeco-politics" so as to bring raw materials policy in relation to the realities of the present and future.

Bidwell concludes:

> It is high time that the President and the Congress should take an all-inclusive view of raw materials policy, instead of dealing with commodities separately in response to the pressures of the moment. Their purpose should be to make sure that measures regulating trade in raw materials reinforce rather than obstruct the aims of foreign economic policy.

It is indeed "high time" that our raw materials policy be brought into harmony with our national policy. These raw materials are part of the basis of our strength necessary to achieve our basic objectives of freedom and security.

Bidwell is to be commended for calling these anachronisms to our attention. This reviewer appreciates his work, yet at the same time, envies the advice and assistance that he received from the Council on Foreign Relations.

As a footnote, special attention should be called to the very valuable, selected, and functional bibliography which is included.

OLIN T. MOUZON
University of North Carolina

Possibilities of Economic Progress. By A. J. Youngson. Cambridge: Cambridge University Press, 1959. Pp. x, 325. $6.00.

"The object of this book is to compare different historical experiences of economic progress so as to try to discover whether or not they

possess any important causative factors in common." Four cases of economic progress are examined: Great Britain, 1750–1800; Sweden, 1850–80; Denmark, 1865–1900; and the southern United States, 1929–54. These case studies, however, follow six analytical chapters on "The Nature and Conditions of Economic Progress." In fact, Professor Youngson introduces historical experience to test hypotheses, not all of which are drawn from historical data.

An introductory chapter explores the problem of measuring progress. Defects are found in all the quantitative criteria commonly used, and progress is tentatively defined as "increase of the power to achieve the economic aims of the community concerned." Later on: "Increased productivity, in industry, agriculture, distribution, is, in our sense, economic progress." Finally, we are assured that output per man must rise to maintain progress, which comes close to saying (as many have said) that real income per head is the least unsatisfactory index of economic growth.

Concerning the conditions of economic progress, Youngson skillfully condenses much of what has been contributed by growth theorists from Smith and Steuart to Harrod and Hicks. The discussion of the "disaggregation of investment," especially, is a salutary warning to avoid the oversimplified mechanics of propensities to spend and save. What economic historians have added to growth analysis, he concludes, is persuasive evidence that models are useful for the short run only. "Theories about economic development, therefore, cannot be precise if they aim at even moderately comprehensive long-run explanation." There are, notwithstanding, three factors, "possibly of first-rate importance," which are provisionally acceptable as fruitful bases for an inquiry into the possibilities of progress. These, briefly, are inventions and new ideas, the supply of enterprise, and the drift toward massive production.

What is the evidence of the case studies? Not surprisingly, Youngson finds it "very hard to generalize and form unprejudiced schemes from the rough and tumble data of history." There is no clear closing of the gap between the factors of "first-rate importance" and the records, spanning collectively two centuries, of four developing countries. Yet the author, modestly discounting the competence of either British or American economists to give advice, offers poor countries "anxious for progress" some prospect of obtaining guidance from historical experience.

The prescriptions are not numerous. First in importance are international contacts, not only to widen the markets of developing countries but also to bring in new ideas and skills. Or, put negatively, accelerated development does not take place in "economies busily isolating themselves from the efforts and risks of international trade." The second prerequisite of progress is a long history of agricultural reform. Subsistence farming in the countries studied was "not merely improved . . . it was eliminated." The third factor is a corollary of the other two: "the complex and yet organic nature of economic development" requires favorable responses in other sectors of the economy to an initial innovation or spurt in some other sector. Otherwise, the historical studies are regarded as providing "interesting information." Apparently, for instance, foreign capital and foreign enterprise are less important than might have been expected.

A final word may be in order concerning Youngson's view of the South. Granting that the South progressed because it was part of a rapidly growing country, the author searches for explanations of the accelerated growth in the southern states in 1929–54. It is fair to say, I think, that without dismissing other influences Youngson attributes much of this growth to policies of the federal government. The farm programs in the 1930's and subsidized industry during the War had relatively greater and more favorable repercussions on the southern economy than in the rest of the country. Farm legislation altered the terms of trade in favor of agriculture, while transfer payments shifted income from the non-South to the South. Two factors tended to check the region's progress: the efforts to narrow regional wage differentials and the failure to break the color line in the labor market. The Englishman's "discovery of the South" is amusingly marred by his assigning to Josephus Daniels the authorship of one of his son's books.

ROBERT S. SMITH

Duke University

Founders of American Economic Thought and Policy. By Virgle Glenn Wilhite. New York: Bookman Associates, 1958. Pp. 442. $6.00.

In presenting "the heart of this study . . . chapters on William Douglass, Hugh Vance, Pelatiah Webster, Tench Coxe, Alexander Hamil-

ton, Benjamin Franklin, John Taylor and Albert Gallatin" Professor Wilhite has seen fit to provide a summary of economic and social thought since ancient times. This lengthy (135 pages) and often highly subjective introduction seems to have little relevance to the sketches presented in "the heart" of the study. Perhaps the heart material was more suited to a long monograph than a book. In the main Wilhite has relied upon the collected editions of the works of his principal characters and he has searched these collections assiduously, but this reviewer often learned more of Professor Wilhite's subjective evaluations than he did of the thought of the "founders of American economic thought and policy." The impression is conveyed that since the writers were pamphleteers rather than text book writers they do not deserve other than the classification "near economist," or that their theories of "value and distribution were weak."

Much use is made of "boxes" for characterizing the thoughts of the men studied. Thus, a writer is either an "economic aristocrat" or an "economic democrat." This type of classification, often naive, and probably dangerous is from the standpoint of the economist less useful than "boxes" related to mercantilism, physiocracy, and classicism; however this volume is undoubtedly also a tract much like those written by its subjects.

VICTOR C. HECK

Mercer University

The Economics of Competition in the Transportation Industries. By John R. Meyer and others. Cambridge, Mass.: Harvard University Press, 1959. Pp. viii, 353. $7.50.

Both carrier management and obsolete pattern of transportation regulation receive much of the blame for uneconomic allocations of resources in the American transportation industries in this volume analyzing the present state of transport policy in the United States. The authors as economists concentrate not on the legal or historical bases of the contemporary transportation problem but on a careful economic analysis, with chapters on the cost, demand and market structure characteristics of the various transport agencies. They describe what would be a more rational allocation of transportation services, with cost data as the prime criteria of a rational allocation. In general terms, the authors suggest that bulk commodities should move by water or pipelines where feasible, while high value merchandise should move via all-rail or piggyback operations. Short haul traffic would be the domain of the motor truck, with most passenger travel moving by auto, airline or bus.

In a discussion of the problems involved in arriving at meaningful cost figures under conditions of multiple products operations, the writers point up the virtues of statistical costing techniques. Their presentation of rail costs is based largely on multiple regression analysis, in contrast to the simple regression methods of the I. C. C. or to conventional cost accounting methods. The data on costs for all forms of transportation are more fully treated here than in most readily available volumes of similar scope and purpose. The cost circumstances of motor truck, water, air, and pipeline are drawn mainly from the work of students in those fields, with the analysis based on these costs very neatly done. For the interest of statistically inclined readers, the authors include in appendices numbering nearly seventy-five pages extended statements concerning the statistical derivation of their rail cost functions.

As one point of comment, the authors perhaps overstate the novelty of their approach to policy matters, for this approach is primarily one suggesting more competition and market direction in the transport field rather than rate bureau and commission control. Many writers have expressed similar positions. The virtue of this study, however, is that its call for less regulation and more competition is based on an extensive analysis of the economic aspects of the transport industries.

One practice pursued by carrier management and fostered by commission decision which comes under heavy attack in the book is value of service pricing. Value of service pricing pretty largely fits the role of a straw man, for certainly not many students of transportation, and increasingly few rate officials of carriers, would subscribe to rates charged in blind ignorance of competitive considerations. Perhaps the aspect of carrier rate policy which can be criticized the most is the relative slowness to understand that the number of alternative sources of supply affect sharply the value of a particular transportation service. Until recently carrier executives have not been sufficiently aware of the impact of competition upon the elasticity of demand for their services. Relatively high rail rates on merchandise

goods have been an open invitation to the trucker, while the misreading of demand considerations by common carrier truck operators encourage private haulage of goods. The authors modify their attack on value of service ratemaking with the view that demand should be joined with costs in the framing of rates.

One interesting conclusion which the authors reach is that an elimination of subsidy through user charges in highway, water and air transport would introduce relatively modest to insignificant shifts in the distribution of traffic. This conclusion is somewhat different from that apparently widely held in some circles, including spokesmen for the railroad industry. In the judgment of the writers, the elimination of highway and airways subsidy would advance truck and airline costs by only three percent and one percent respectively. In truck transport furthermore, the authors are of the view that subsidy exists only with trucks using diesel fuel.

The policy recommendations of the book include greater freedom in ratemaking, maximum rate regulation where monopoly is likely, some amount of minimum rate control (though some question is raised about this), elimination of rate bureaus, abandonment facilitated where it is clear that this is the only alternative available, and freedom of entry, particularly in the motor truck and airline fields. Even though regulation is generally lambasted in the volume some amounts of rate regulation would remain.

Reform is felt to be needed also in carrier management and unions, with an infusion of imagination, knowledge, and vigor required to institute practices such as trailer-rail movements and adjustments in rates to the cost circumstances of shipment. Many of these improvements, according to writers, could be made within the framework of existing regulation.

All in all this is a very effective treatment of transportation economics materials, with the book as a real possibility as a core volume for economics of transportation courses. The emphasis upon costs, demand characteristics and market structures, coupled with considerable descriptive material, make it an excellent framework for course discussion of business and public policy issues.

HAROLD L. JOHNSON

Emory University

Industrial Relations Systems. By John T. Dunlop. New York: Henry Holt and Company, 1958. Pp. xiii, 399. $5.75.

Professor Dunlop suggests that historically "the study of industrial relations has had little theoretical content" (p. 6); that the present volume offers "a general theory of industrial relations" (p. vii); and that this theory is "designed to shift industrial relations perspective from collective bargaining . . . to the full spectrum of contemporary industrial relations" (p. 380). He argues that an industrial-relations system "is on the same logical plane as an economic system" and that its study requires "a distinctive analytical apparatus" (p. 382). The study is based in part on the work of the Inter-University Study of Labor Problems in Economic Development (Ford Foundation), in which the author was a prominent participant.

The substance of the volume may be briefly summarized. The essence of industrial relations systems is found in the establishment and administration of rules of the work place and of the work community. These rules are shaped, lived under, and changed by the "actors" (Dunlop's terminology) who participate in the industrial relations drama. The actors are workers and their (formal or informal) organizations; managers and their organizations; and the representatives of government agencies concerned with the work place and work community. The actors perform their roles within environments the principal features of which are: (1) the technological characteristics of the enterprise and of the larger industrial community; (2) the "market or budgetary constraints" to which the actors are subject; and (3) the locus and distribution of power within the community.

These formulations appear unexceptional. Surely the factors enumerated by Dunlop have long been taken into account by competent students of industrial relations, certainly by those who have approached the subject from the vantage points of economics and history. Nevertheless, if one agrees, as the reviewer does, that Dunlop has emphasized the critical elements in industrial relations analysis, the volume may well contribute to better understanding and to more consistent research in the field. It may be of particular use to investigators in the industrially less advanced countries.

The impression that the book promises too much (in the way of a "distinctive analytical

apparatus") is strengthened by its illustrative chapters. An account is given of selected working rules in bituminous coal mining and building construction in a number of countries, with emphasis on similarities and differences as reflecting adaptations to technological, market, or power factors. A chapter is devoted to current industrial relations practice in Yugoslavia, and two chapters are concerned with the evolution of aspects of industrial relations (e.g., labor force recruitment) in different stages of economic development. While much of this material is interesting, the treatment does not reflect sharp new insights derived from innovations in industrial relations theory.

H. M. Douty
U. S. Department of Labor

Manager Selection, Education and Training. By Willard E. Bennett. New York: McGraw-Hill Book Company, 1959. Pp. 210. $6.00.

Mr. Bennett's book is an eloquent plea (1) for a recognized professional status for modern corporate managers, (2) for a professional approach to the selection, education and training of corporate managers, and (3) for an understanding of the current necessity that mid-twentieth century Americans make education a serious and approved life-time process. Mr. Bennett regards the latter as absolutely essential to the attainment of a professional status for corporate managers; unlike the established professions of Law, Medicine, Engineering, etc., which involve the acquisition of the appropriate educational background, training and proficiency to prepare the individual to be a competent practitioner at his chosen level of specialization, the corporate manager must throughout his working life be constantly engaged in preparing himself for the next higher level of specialization or competency at which he may be expected to function as he progresses through the management hierarchy of the modern corporation.

With the impact of the modern corporation upon American life what it is and with the importance that the American way of life and America hold for the very future of society today, this plea is both timely and urgent. It may also be noted that a new attitude toward and appreciation of the importance of education, which demands a higher level of competency and recognizes education to be a serious life-time process, is essential to all groups in our society. Mr. Bennett scores the prevailing attitude which causes the diploma or the degree to be regarded as the be-all and end-all of the formal educational process, and which leads to a search for a similar superficial terminal objective or credential in industrial manager training.

This book will undoubtedly have a significant impact on inservice manager training in the nation's corporations, if only because it so thoroughly analyzes the deficiencies in current policies, programs and practices. On the positive side, the theory, curriculum and over-all plan for manager development proposed by Mr. Bennett will deserve the careful attention of top management of the nation's corporations, of the individual corporate manager at any level who is concerned about his own professional development, of the faculties of the nation's schools of business, and of college students who aspire to careers in corporate management. The book is well-written and is most interesting reading. It is itself an impressive testimony to the validity of Mr. Bennett's major premise: that only by making education a serious life-time process can we produce men and women who may be able to guide American business enterprise successfully in the fantastically complex and rapidly changing world in which we live. The author of this book is an example of this premise applied; he is Labor Relations Superintendent, Cities Service Refining Corporation, Lake Charles, Louisiana.

William D. Ross
Louisiana State University

NOTES

TENTATIVE PROGRAM OF THE TWENTY-NINTH CONFERENCE OF THE SOUTHERN ECONOMIC ASSOCIATION

Hotel Robert Meyer, Jacksonville, Florida, November 20 and 21, 1959

THURSDAY, NOVEMBER 19, 1959

5:00 P.M.—Meeting of the Executive Committee

FRIDAY, NOVEMBER 20, 1959

Morning Sessions

10:00 A.M.—Seminar A: *The Theory of Profit*

Chairman: Fritz Machlup, Johns Hopkins University

1. "Rehabilitation of Naive Profit Theory," Martin Bronfenbrenner, University of Minnesota
2. "Profit Theory and Applications," J. Fred Weston, University of California, Los Angeles. Discussion: John S. Henderson, University of Alabama
3. "Equilibrium, Competition, and Profit," Alfred Sherrard, American University. Discussion: R. W. Pfouts, University of North Carolina

10:00 A.M.—Seminar B: *Latin American Economic Growth*

Chairman: William P. Dillingham, Florida State University

1. "Inflation and Growth: The Case of Brazil," Aurelius Morgner. Discussion: Reynold E. Carlson, Vanderbilt University
2. "The Main Experiences and Policies of the Industrial Revolution in Latin America," Pedro C. M. Teichert, University of Mississippi. Discussion: Robert L. Sammons, Federal Reserve Board of Governors
3. "Puerto Rico's Tax Exemption and the Principle of Gross Avarice," David F. Ross, Bethany College. Discussion: Harry Stark, University of Miami

10:00 A.M.—Seminar C: *Public Regulation of Rate-Making*

Chairman: William D. Ross, Louisiana State University

1. "The Economics of Natural Gas Rate-Making by the Federal Power Commission," Eli W. Clemens, University of Maryland. Discussion: Charles E. Landon, Duke University
2. "Telephone Rate Regulation in Louisiana," James P. Payne, Louisiana State University. Discussion: Harold L. Johnson, Emory University
3. "The Value of Service Principle in Motor Truck Rate Making," William D. Maxwell, Tulane University. Discussion: Milton Z. Kafoglis, University of Florida

10:00 A.M.—Seminar D: *Labor Economics*

Chairman: Frank T. deVyver, Duke University

1. "Some Unsettled Problems in Wage Theory," Allan Cartter, Duke University. Discussion: Ray Marshall, Louisiana State University
2. "A Reappraisal of Regional Wage Differentials," James A. Morris, University of South Carolina. Discussion: Robert L. Bunting, North Carolina State College
3. "Implications for the Texas Trade Union Movement of Some Projected Changes in the Texas Labor Force," E. Eugene Liebhafsky, Agricultural and Mechanical College of Texas. Discussion: Norman Wood, University of Georgia

10:00 A.M.—Seminar E: Marketing Program

10:00 A.M.—Seminar F: Management Program

Afternoon Sessions

2:30 P.M.—Seminar A: *Coordination of Monetary and Fiscal Policy*

Chairman: Clement H. Donovan, University of Florida

1. "Division of Labor Among Fiscal, Monetary, and Debt Management Policy," Herbert Stein, Committee for Economic Development. Discussion: Alfred P. Johnson, Federal Reserve Bank of Atlanta
2. "Monetary-Fiscal Policy and the Growth Objective," James Schlesinger, University of Virginia. Discussion: Clayton C. Curtis, University of Florida
3. "Embryonic Central Banking Policy in the Nineteenth Century," Richard Timberlake, Jr., Florida State University. Discussion: Eugene Lerner, City College of New York

2:30 P.M.—Seminar B: *Economic Problems of Metropolitan Areas*

Chairman: Richard Muth, University of Chicago

1. "Normative Aspects of Metropolitan Finance," Charles M. Tiebout, University of California, Los Angeles. Discussion: Werner Z. Hirsch, Resources for the Future
2. "Economics of Parking," Frank Howard, University of Mississippi. Discussion: C. E. Ratliff, Davidson College
3. "Demand and Fare Structures in the Transit Industry," Carl Stern, Randolph-Macon Womans College

2:30 P.M.—Seminar C: *Economic Accounting*
Chairman: Frank A. Hanna, Duke University
1. "National Income and the National Balance Sheet," John O. Blackburn, Duke University
2. "Money-Flows and the Product Accounts: United States and Canada," John F. Haberer, New England Life Insurance Company
3. "Integration of International Social Accounting Systems," Robert E. Hill, University of Illinois

2:30 P.M.—Seminar D: *Economics of Education and Health*
Chairman: W. D. Robbins, University of Richmond
1. "The Financing and Administration of Education," John Van Sickle and Ben A. Rogge, Wabash College. Discussion: W. H. Read, University of Tennessee
2. "The Value of Human Capital," Burton A. Weisbrod, Washington University
3. "Financing of Medical Expenses," Rashi Fein, University of North Carolina. Discussion: Richard B. Johnson, Southern Methodist University

2:30 P.M.—Seminar E: Marketing Program

2:30 P.M.—Seminar F: Management Program

6:00 P.M.—Dinner Meeting of Officers, Editors, and Correspondents

Evening Session

8:00 P.M.—President's Address
Chairman: George Stocking, Vanderbilt University
"Southern Tradition and Regional Economic Progress," William H. Nicholls, Vanderbilt University

SATURDAY, NOVEMBER 21, 1959

7:45 A.M.—University of Virginia Breakfast

9:00 A.M.—Annual Business Meeting

10:00 A.M.—Seminar A: *Recent Developments in Antitrust Policy*
Chairman: James M. Waller, University of Georgia
1. "Recent Developments in Price-Fixing Cases: Theory and Policy," Almarin Phillips, University of Virginia
2. "Some Implications of Administered Pricing," Padriac Frucht, U.S. Chamber of Commerce. Discussion: Walter Austin, Florida A & M University
3. "Current Issues in Antitrust Administration," Frank J. Kottke, Federal Trade Commission. Discussion: Donald Dewey, Duke University

10:00 A.M.—Seminar B: *Income Distribution and Redistribution*
Chairman: Charles T. Taylor, Federal Reserve Bank of Atlanta
1. "British Income Distribution in 1938, 1949, and 1955," John A. Brittain, Vanderbilt University
2. "Income Distribution and Economic Structure," Charles T. Stewart, Jr., U.S. Chamber of Commerce
3. "Income Distribution and Southern Economic Development," Werner Hochwald, Washington University. Discussion: Charles E. Ferguson, Duke University

10:00 A.M.—Seminar C: *International Trade*
Chairman: Clark Lee Allen, Southern Illinois University
1. "The International Transfer of Know-How Through Licensing: Some Theoretical and Policy Questions," Wilson Schmidt, George Washington University
2. "Capital Yields in Backward Countries," Carter Murphy, Washington University. Discussion: E. M. Shamsedin, University of South Carolina
3. "The International Monetary Fund and International Adjustment," William R. Allen, University of California, Los Angeles. Discussion: Lawrence F. Mansfield, Hollins College

10:00 A.M.—Meeting of the Incoming and Outgoing Executive Committees

DEATHS

W. B. Harlan, assistant professor of business administration at Mississippi Southern College, died July 7, 1959.

Jack Johnson, formerly director of Economics and Sociology and dean of the Graduate School at North Texas State College, died June 5, 1959.

APPOINTMENTS, PROMOTIONS AND RESIGNATIONS

John Abernathy has been appointed instructor in economics at Mississippi State University.

Charles Allen, assistant professor of business administration at Mississippi Southern College, has resigned to return to graduate school at Louisiana State University.

Lewis N. Amis, of the University of Arkansas, has been appointed associate professor of economic and business administration at Southwestern at Memphis.

Carl A. Anderson, assistant professor of accounting, University of Florida, spent six weeks during the summer of 1959 with the Florida Power Corpo-

ration under their college-business exchange program.

Edward C. Atwood, Jr. has been promoted to associate professor of economics at Washington and Lee University.

Frank Bain has been appointed professor of management at Mississippi State University.

James W. Baker, formerly at the University of Michigan, has been appointed assistant professor of accounting at the College of Business Administration, University of Georgia.

James F. Bateman has been appointed part-time instructor in economics in the School of Business Administration, University of North Carolina.

William R. Beaton has been promoted to associate professor of business administration in the College of Business Administration, University of Georgia.

Elizabeth Beidlman has joined the staff in Business Administration at Morristown College (Tennessee).

Algernon S. Belcher, professor of economics and chairman of the Social Sciences Department, was promoted to dean, School of Arts and Sciences, South Carolina State College.

Lorenzo M. Belotti, of the University of Texas, has been appointed assistant professor of economics at Santa Clara University.

L. J. Benninger has been promoted to professor of accounting, University of Florida.

George Wesley Bishop has been appointed assistant professor of transportation at the University of Tennessee.

John O. Blackburn is a member of the faculty of the Department of Economics and Business Administration, Duke University, for the academic year 1959–60.

C. P. Blair, assistant professor of international trade at the University of Texas, is on leave until June, 1960, while serving as visiting professor at Nuevo Leon, Monterrey, Mexico.

Ralph H. Blodgett, professor of economics, University of Florida, served as economic consultant on the staff of the Tennessee Valley Authority during the summer, 1959.

William H. Bonner, assistant professor of business education at the University of Tennessee, is on leave during 1959–1960 to pursue graduate study at Ohio State University.

Joseph M. Bonin, formerly of the University of Arkansas, has been appointed assistant professor in economics at Louisiana State University in New Orleans.

Elbert V. Bowden has been promoted to professor and head of the Department of Economics at the College of William and Mary in Norfolk.

Robert W. Bradbury, professor of economics, University of Florida, has been appointed lecturer under the Fulbright and Smith-Mundt programs at the University of Paraguay during the first term, 1959–60.

Louis K. Brandt has been granted a leave of absence from the University of Mississippi to accept a Ford Foundation grant to teach at Gadjah Mada State University, Java, Republic of Indonesia.

Editha R. Morris Brannock has been appointed part-time instructor in economics in the School of Business Administration, University of North Carolina.

J. H. Brashear, lecturer in economics at the Women's College of the University of North Carolina, is on a part-time teaching basis for the academic year 1959–1960 while continuing work on his doctorate at the University of North Carolina.

J. Herman Brasseaux, associate professor of accounting, has joined the faculty of the Division of Commerce Studies at Louisiana State University in New Orleans. He was formerly at the University of Arkansas.

Horace R. Brock, on leave at the Ohio State University, returned to his position as professor of accounting at North Texas State College, in September, 1959.

Phillips H. Brown, formerly assistant professor of finance at the University of Arkansas, is now a member of the staff of the Bureau of Business and Economic Research at that institution.

James M. Buchanan, of the University of Virginia, has been awarded a Ford Foundation Faculty Research Fellowship for the academic year 1959–1960. He will be on leave from the chairmanship of the James Wilson Department of Economics.

Donald C. Bunch, assistant professor of business administration at The Citadel, was a Fellow in the Economics-in-Action program at Case Institute of Technology during the summer of 1959.

William Burnett has accepted a position as assistant professor of business administration at Mississippi Southern College.

J. Donald Butterworth, professor of marketing, University of Florida, worked during the summer months as summer marketing consultant, Region 4, Small Business Administration, Richmond, Virginia.

James Byers resigned as instructor in business administration at Texas A. and M. College to accept an appointment to the faculty of Texas Western College, effective September, 1959.

Vincent E. Cangelosi has been appointed instructor of management and marketing at Louisiana State University in New Orleans. He was formerly at the University of Arkansas.

Andrew Capesius, O.S.B., has been added to the staff of the Department of Business Administration, St. Bernard College (Alabama).

Thomas W. Carlin has been appointed assistant professor of business administration at the College of William and Mary in Norfolk.

Julius E. Carpenter has been appointed instructor in business administration at Tennessee A & I State University.

Stanley Carpenter, who has been at Louisiana State University in New Orleans, has accepted a position as assistant professor of accounting at Mississippi Southern College.

T. G. Carpenter has resigned as instructor of economics, University of Florida, to become assistant director of Housing at that institute.

John R. Carrell, of Southern Methodist University, has been appointed assistant professor of business law at North Texas State College, effective September, 1959.

R. Woodrow Castle has joined the staff in Business Administration at East Tennessee State College.

James E. Chace, professor of real estate, University of Florida, has been granted a leave of absence for the year 1959–60 to serve as visiting professor at the University of Arizona.

H. H. Chapman has retired as professor of business statistics in the School of Commerce and Business Administration, University of Alabama.

Avery B. Cohan has been promoted to associate professor of business administration in the School of Business Administration, University of North Carolina.

M. R. Colberg, professor and chairman of the Department of Economics at Florida State University, attended the Political Economy Conference held at Claremont College, Claremont, California, during the month of June, 1959.

Ben R. Copeland has been appointed instructor in accounting at North Texas State College, effective September, 1959.

John A. Copps, formerly chairman of the Economics Staff at Stetson University, has accepted a position as associate professor of economics at Western Michigan University.

Gladys Cothran has been appointed instructor in business education at Tennessee A & I State University.

Albert M. Craig has been appointed instructor in industrial management at the University of Tennessee.

L. L. Crum, formerly of the University of Texas, has been appointed assistant professor of finance, University of Florida.

Cecille V. Crump is associate professor and head of the Department of Business Education at Tennessee A & I State University.

Carl Crutchfield has been appointed instructor in business administration at Tennessee A & I State University.

George W. Cubberly, assistant professor of marketing, has returned to the University of Miami after a two-year leave of absence spent in working towards the doctor in business administration degree at the Harvard Graduate School of Business Administration.

Joseph Curry is on leave from Mississippi State University as a Ford Foundation fellow.

Lewis E. Davids, formerly with the Agricultural and Mechanical College of Texas, has been appointed professor of finance at the College of Business Administration, University of Georgia.

J. Kenneth Davies, who is on sabbatical leave from Brigham Young University, is a member of the faculty of the Department of Economics and Business Administration, Duke University, for the academic year 1959–60.

James N. Davis, formerly assistant professor at Harding College, has been appointed associate professor of economics at the University of Mississippi.

Samuel D. Dawkins, Dallas attorney, has been appointed instructor of business law at North Texas State College, effective September, 1959.

Gabriella Day, of the University of Texas, has been appointed instructor in office administration in the Hankamer School of Business, Baylor University, effective September, 1959.

Don T. DeCoster, of the University of Texas, has been appointed assistant professor of accounting at Arizona State University, effective September, 1959.

Walter H. Delaplane, formerly dean of Arts and Sciences at Texas A. and M. College, is now dean of Arts and Sciences and professor of economics at Southern Methodist University.

Carl T. Devine, professor of accounting, University of Florida, will be on leave to serve on the staff of the Massachusetts Institute of Technology during 1959–60.

Robert T. Dinman has resigned as professor of accounting, University of Florida, and will remain at the University of Indonesia in Djakarta, Indonesia.

Charles H. Dodge has been appointed instructor in accounting at the University of Tennessee.

Coy Dorman has been appointed instructor in geography, Department of Economics and Business Administration, Alabama Polytechnic Institute.

James Dozier has been promoted to assistant professor of business administration at Texas A. and M. College.

Edgar S. Dunn, Jr. has been promoted to professor of economics, University of Florida, upon his return from a year in the Paris Headquarters of OEEC.

John M. Dyer, associate professor of marketing, University of Miami, has been granted a leave of

absence to serve as staff director, Latin American Subcommittee of the United States Senate.

Claudia Patton Easterly has been appointed head of the Department of Business Administration at Morristown College (Tennessee).

William C. Edel, assistant professor of industrial management, Clemson College, attended the Economics-in-Action Program during the summer at Case Institute of Technology in Cleveland, Ohio.

W. Wilson Ellis has accepted a position as assistant professor of business administration at Mississippi Southern College.

Leon M. Ennis has been appointed part-time instructor in accounting in the School of Business Administration, University of North Carolina.

James E. Estes, formerly lecturer in management at the University of Texas, has been appointed assistant professor of management at the University of Arkansas, effective September, 1959.

R. B. Eutsler has been granted a leave of absence from his position as professor of economics, University of Florida, to serve as lecturer on the staff of the University of Indonesia, Djakarta, Indonesia.

Ross A. Evans, of the Accounting Department, Rollins College, has been granted a leave of absence which he will spend in travel.

William C. Flewellen has resigned as assistant dean in order to do full-time teaching in the School of Commerce and Business Administration, University of Alabama.

Jack W. Floyd has been appointed part-time instructor in accounting in the School of Business Administration, University of North Carolina.

Howard Folts, of the School of Commerce and Business Administration, University of Alabama, has been appointed assistant dean of that school.

Kenneth H. Foote resigned in June as assistant professor of accounting at The Citadel to go into business for himself.

Ben Forbes has returned to Mississippi Southern College as professor and chairman of the Department of Accounting.

Francesco Forte, of the University of Urbino (Italy), has been awarded a postdoctoral fellowship in political economy by the Thomas Jefferson Center for Studies in Political Economy at the University of Virginia for the academic year 1959–1960.

W. M. Fox has resumed his position as associate professor of management, University of Florida, after serving during the past year as Fulbright lecturer at the University of Helsinki.

Charles S. Franklin has been appointed instructor in economics at the University of Tennessee.

William J. Frazer, Jr. has been granted a leave of absence from his position as assistant professor of finance, University of Florida, to participate in the Ford Foundation Institute of Basic Mathematics for Application to Business at the Massachusetts Institute of Technology for 1959–1960.

Joan Frisbee has joined the staff of Carson-Newman College as assistant professor of business administration.

Charles W. Fristoe, associate professor of economics, University of Florida, taught during the summer session at Northeast Missouri State Teachers College.

Claude S. George, Jr. has been promoted to professor of industrial management in the School of Business Administration, University of North Carolina.

Paul Geren, formerly executive vice president of Baylor University, is now director of the Dallas Council of World Affairs and professor of economics at Southern Methodist University.

Hans W. Gerhard, formerly of Catawba College, will teach in the Department of Economics and Business Administration, Duke University, for the academic year 1959–60.

Arthur Sholley Gifford has been appointed instructor in the department of business at Delta State College.

Ray Y. Gildea has been appointed assistant professor in the Department of Economics and Business Administration, Alabama Polytechnic Institute.

Donald M. Glossner is associate professor of business administration at Carson-Newman College.

Irving J. Goffman, formerly of Duke University, has been appointed assistant professor of economics, University of Florida.

Donald Grandbois has resigned as instructor of marketing, University of Florida, to resume his studies for the doctorate at the University of Indiana under a Ford Foundation Fellowship.

Melvin L. Greenhut, formerly professor of economics at Florida State University, has been appointed professor of economics and associate dean of the School of Business Administration of the University of Richmond. He will also serve as director of the Evening Division of the School.

William F. Hardin, Jr. has been appointed part-time instructor in economics in the School of Business Administration, University of North Carolina.

D. J. Hart, dean of the College of Business Administration, University of Florida, participated in the Symposium on Business sponsored by the DuPont Company, Wilmington, Delaware, during June 1959.

Lawrence Harvey, formerly with IBM in Dallas, has been appointed assistant professor of business administration at North Texas State College, effective September, 1959.

William H. Hatcher, assistant professor of economics and history at Virginia Polytechnic Insti-

tute, has resigned to accept a position at Northeast Missouri State Teacher's College.

R. Murray Havens, head of the Department of Economics, University of Alabama, has returned from a lectureship at University College, Dublin, Ireland.

Porter W. Henderson, Jr., of the University of Michigan, has been appointed assistant professor of accounting at North Texas State College, effective September, 1959.

Vivian W. Henderson has been appointed professor of business administration and economics at Tennessee A & I State University.

William G. Heuson, University of Miami, has been promoted to professor of finance.

Max Hibbs has been appointed visiting assistant professor of business statistics in the School of Commerce and Business Administration, University of Alabama.

Joe M. High is head of the Department of Business Administration at Carson-Newman College.

Donald W. Hill, Rollins College, has resigned to do graduate study at American University.

David C. Hodge has resigned as research assistant, Bureau of Business Research, University of Tennessee, to become assistant director, Bureau of Business Research, University of Georgia.

Robert S. Hoeke has resigned as instructor in industrial management at the University of Tennessee to do terminal graduate work at the University of Wisconsin.

Kenneth J. Holcomb has been appointed assistant professor of economics at Alabama Polytechnic Institute.

William S. Hollis has resigned as assistant professor in the Department of Business at Delta State College.

John D. Holmes, of the University of Illinois, has been appointed professor of economics at Prairie View A. and M. College.

William G. Holsclaw has been appointed assistant professor of business administration at Carson-Newman College.

Paul T. Homan, formerly professor of economics at University of California at Los Angeles, is now professor of economics at Southern Methodist University.

Dale M. Hoover has been appointed assistant professor of agricultural economics at North Carolina State College in Raleigh, effective in September, 1959.

Charles M. Hummel, who was awarded his Ph.D. by the University of Virginia in June, has been appointed associate professor of economics and business administration at Davidson College.

D. D. Humphrey is on leave of absence during the academic year 1959–60 from the Department of Economics and Business Administration, Duke University. He will go to India as a member of a senior research group arranged by The Center of International Studies of Massachusetts Institute of Technology.

Carl Hunt, who received his M.B.A. from the University of Arkansas in August, has been appointed instructor in the Department of Accounting, Little Rock University.

Ray C. Hunt, Jr. has been promoted to assistant professor of commerce in the McIntire School of Commerce of the University of Virginia.

Robert L. Hurt, professor of agricultural economics at South Carolina State College, was promoted on July 1 to director of Graduate Extension.

Stephen S. Irvine has resigned as instructor of accounting at the University of Tennessee to enter private industry.

Elmo L. Jackson, professor of economics, University of Florida, attended the Statistics Institute at the University of Wyoming during the summer, 1959.

F. H. Jackson, assistant professor of economics at Florida State University, attended the Political Economy Conference at the University of North Carolina during the summer, 1959.

Hans Jensen, associate professor of economics at the University of Alaska, has received a grant from the Ford Foundation so that he may return to the University of Texas during 1959–60 and complete his doctoral dissertation.

Thomas H. Jerdee has been appointed lecturer of business administration in the School of Business Administration of the University of North Carolina.

Clack Joel, assistant professor in economics at the College of William and Mary in Norfolk, spent the summer of 1959 in Korea completing research for his forthcoming study on Korean inflation.

Frederick C. Joerg, of the Department of Economics and Business Administration, Duke University, is on leave during the academic year 1959–60. He will be lecturing at the Institut pour l'Etude des Methodes de Direction de l'Enterprise (IMEDE), Lausanne, Switzerland.

Dorothy Jones has been appointed associate professor in business administration at the College of William and Mary in Norfolk.

Rose Jones has been appointed instructor of business education at Harding College.

Milton Kafoglish, assistant professor of economics, University of Florida, served as research economist with Ohio State University during the Summer, 1959.

James Kelley, who has been doing graduate work at the University of Alabama, has accepted a position as associate professor of accounting at Mississippi Southern College.

Patrick S. Kemp, formerly at the University of

Illinois, has been appointed assistant professor of business administration at the School of Business Administration, Emory University.

Randolph G. Kinabrew, professor of economics at the University of Mississippi, worked during the summer on a cooperative research project with the United States Forest Service, studying the Memphis market for North Mississippi hardwoods.

Thomas Kirkpatrick has resigned as instructor in business administration at Texas A. and M. College to pursue graduate work at Ohio State University.

Paul E. Koefod, associate professor of economics, University of Florida, served as a member of the staff at Duke University during the summer, 1959.

Clarence E. Kuhlman, formerly professor of transportation at the University of Tennessee, joined the faculty of Business Administration at The Citadel in September, 1959.

John D. Lambert has been promoted to assistant professor in the School of Business of Richmond Professional Institute (Virginia).

Marlin V. Law has been promoted to assistant professor of industrial management at Georgia Institute of Technology.

Roy L. Lassiter has been promoted to associate professor of economics, University of Florida. During 1959-60 he will be carrying on a research project under a grant from the Southern Universities Research Council.

Richard Ivor Levin has been promoted to assistant professor of industrial management in the School of Business Administration, University of North Carolina.

Robert E. Linde resigned as assistant professor of accounting at the University of Texas to accept a position with the American Hospital Association in Lincoln, Nebraska.

James W. Lloyd has joined the staff in Business Administration at East Tennessee State College.

Justin G. Longenecker has been promoted to professor of management in the Hankamer School of Business, Baylor University, and attended the 1959 summer Case Seminar Program at Harvard University.

Fritz A. McCameron, formerly of Georgia State College of Business Administration, has accepted a position as associate professor of accounting at Louisiana State University.

E. V. McCollough has resigned from Louisiana State University to accept a position as associate professor of accounting at Ohio State University.

H. L. McCracken, professor and head of the Department of Economics at Louisiana State University since 1934, retired June 1, 1959.

Floyd B. McFarland, of the University of Texas, has been appointed instructor in economics at Texas College of Arts and Industries.

B. C. McGough, instructor of real estate, University of Florida, spent six weeks during the summer, 1959, with the Equitable Life Assurance Society under the college-business exchange program.

Vincent McKenna, formerly at Texas A. and M. College, has accepted a position as associate professor of economics at Mississippi Southern College.

W. W. McPherson, formerly professor of agricultural economics at North Carolina State College, is now with the United Fruit Company in La Lima, Honduras.

Herbert S. Madaus, formerly associate professor of secretarial science at Coe College, has joined the faculty of Louisiana State University in New Orleans.

Edward O. Malott, Jr. resigned June 1, 1959, as lecturer in business administration, University of Virginia Graduate School of Business Administration, to enter private business.

L. F. Mansfield, formerly assistant professor of economics at Florida State University, has been appointed associate professor of Economics at Hollins College.

F. Ray Marshall, associate professor of economics at Louisiana State University, will be on leave of absence during 1959-60. He will be engaged in conducting two comprehensive research projects which will result in two book length publications, one for the Ford Foundation and the other for Harvard University.

John T. Masten, professor of economics at the University of Kentucky, attended the Forum on Finance sponsored by the Joint Committee on Education, New York University, Summer, 1959.

John C. Mettler was awarded the Ph.D. degree in June at Clark University and was promoted to associate professor of Business Administration at The Citadel.

James F. Miles, associate agricultural economist, Clemson College, attended the fourth Political Economy Conference during the summer of 1959 at the University of North Carolina.

D. Gray Miley, who has been in private business since he left the superintendency of the Delta Branch Experiment Station in 1952, has returned to the academic field as professor and head of the Department of Business and Economics at Mississippi College.

Hudson Millar, owner and manager of radio stations in Alabama, has joined the faculty of the Department of Business Administration at St. Bernard College.

George G. Miller, formerly lecturer in management at the University of Texas, has been appointed assistant professor of management at Arizona State University, effective September, 1959.

Robert E. Miller, assistant professor of business administration at The Citadel, resigned at the end of the fall semester, 1959.

Francis N. Millet has been appointed part-time instructor in accounting in the School of Business Administration, University of North Carolina.

Charles N. Millican, formerly director of the Division of Business Adimnistration, Hardin-Simmons University, has been appointed dean of the College of Business Administration at the new State University of South Florida at Tampa.

J. W. Milliman, formerly at the University of California at Los Angeles, has accepted an appointment as associate professor of agricultural economics in the School of Business, Indiana University.

Charles E. Milton has been appointed assistant professor of commerce in the McIntire School of Commerce of the University of Virginia. He recently completed requirements for the Ph.D. degree at the University of North Carolina.

William G. Modrow has resigned as assistant professor of economics at Texas A. and M. College to accept a faculty award from the Southern Fellowship Fund for the purpose of completing his doctoral dissertation at Indiana University.

Amos M. Moore, of the University of North Carolina, has been appointed assistant professor of finance at Louisiana State University.

John R. Moore, associate professor of economics, the University of Tennessee, is on leave to attend the Ford Foundation Fellowship Institute of Basic Mathematics at Harvard University.

Daniel C. Morgan, formerly at the University of Wisconsin, has been appointed assistant professor of economics at the University of Tennessee.

William L. Morgan has resigned at Harding College to enter private business.

Arthur B. Moss, associate professor of marketing at the University of Virginia Graduate School of Business Administration, has been granted a year's leave of absence beginning June 1, 1959, to join the faculty of IMEDE, Campagne de Bellerive, Lausanne, Switzerland.

Felix Muehlner, formerly research economist, Bureau of Economic and Business Research, University of Florida, has been appointed associate professor of management at that institution.

George N. Nichols has resigned as associate professor in economics at the College of William and Mary in Norfolk to accept an appointment with the Virginia State Department of Conservation and Development in Richmond.

R. W. Niemela, assistant professor of management, University of Florida, served as consultant to the Florida Power & Light Company during the summer, 1959.

G. Warren Nutter, professor of economics, is acting chairman of the James Wilson Department of Economics of the University of Virginia during the current academic year.

Alvin J. Obelsky, University of Miami, has resigned his position as assistant professor of economics to continue his doctoral studies at the University of Michigan.

Bertil Ohlin, of Sweden, is serving as distinguished visiting scholar with the Thomas Jefferson Center for Studies in Political Economy at the University of Virginia during the first term of the 1959–1960 academic year.

Clifton J. Oliver, Jr., associate professor of management, University of Florida, has been appointed director of the Management Center at that institution.

John E. Oliver, who has retired from the United States Army, has been appointed assistant professor of business administration at Texas A. and M. College, effective September, 1959.

James Roy Ott has been promoted to associate professor of economics at Harding College.

Allan V. Palmer has completed his leave of absence and has rejoined the faculty of Economics and Business Administration at the College of William and Mary in Norfolk.

James W. Parsons, Jr. has been promoted to professor of accounting in the Hankamer School of Business, Baylor University.

Robert W. Paterson, formerly professor of economics and director of Business and Economic Research at the University of South Carolina, has resigned to become professor of business research and director of the Bureau of Business and Economic Research at the University of Mississippi.

Emmanuel M. Paturis has been appointed part-time instructor in accounting in the School of Business Administration, University of North Carolina.

Robert B. Pettengill, of the economics staff of Rollins College, has resigned his position to accept an appointment at American University, Beirut, Lebanon.

Charles F. Phillips, Jr., formerly of Harvard University, has been appointed assistant professor of economics at Washington and Lee University.

Joseph D. Phillips, who recently received his Master's degree from Georgia Institute of Technology, is now assistant professor of business administration at The Citadel.

Lawrence Philips, O.S.B., has been added to the faculty of the Department of Business Administration, St. Bernard College.

R. Bruce Prouty, assistant professor of business administration, Virginia Polytechnic Institute, has been granted a leave of absence to pursue further graduate study at the University of Alabama for the year 1959–60.

Ben Puyper has resigned as instructor of accounting at Mississippi Southern College to enter private practice.

Leroy Qualls has resigned from the University of

Florida to accept a position on the staff of the Florida State Budget Director.

Charles L. Quittmeyer, associate professor of commerce in the McIntire School of Commerce of the University of Virginia, is completing a study of manufacturing development of the Southern Appalachian region as part of a Ford Foundation sponsored program. He has also been awarded a grant by the American Management Association and the Academy of Management to undertake a study of the use of management consultants by industry.

Thomas J. Reed, of the College of William and Mary in Norfolk, has been appointed consultant for the Southeastern Regional Planning Commission to work on an Economic Base Study for the Southeastern Virginia area.

John A. Reinecke, formerly at the University of Illinois, has been appointed assistant professor of management and marketing at Louisiana State University in New Orleans.

William N. Renfro, formerly of the University of Virginia, has been appointed assistant professor of economics at Virginia Polytechnic Institute.

Charles W. Richard has joined the faculty of the Department of Business Administration, St. Bernard College.

J. J. Richison has resigned from Louisiana State University to accept a position as assistant professor of accounting at Arizona State College.

Joseph W. Romita has been appointed to the economics staff at Rollins College.

Warren Rose has been appointed assistant professor of transportation at the University of Tennessee.

David F. Ross has resigned as associate professor of economics at Florida State University, and has been appointed professor and head of the Department of Economics at Bethany College (West Virginia), effective September, 1959.

William Rotch, formerly research associate at the Harvard University Graduate School of Business Administration, has been appointed fellow in business administration at the Graduate School of Business Administration, University of Virginia.

Neville L. Rucker has been appointed assistant professor in economics at the College of William and Mary in Norfolk.

Walter K. Rutledge has been appointed instructor of accounting, Department of Economics and Business Administration, Alabama Polytechnic Institute.

Joel W. Sailors has been promoted to associate professor of economics at the University of Houston, effective September, 1959.

Thomas C. Sanders, formerly associate professor of economics and acting director of the Evening School of Business Administration, University of Richmond, has accepted a position with the Federal Reserve Bank of Richmond.

Kehar Sangha, economist for the Punjab National Bank in New Delhi, India, is serving as visiting professor in the Division of Economics and Business Administration at the College of William and Mary in Norfolk, during the academic year 1959–60.

Edward F. Sauer, formerly manager of the student loan and employment office at Texas A. and M. College, has been appointed assistant professor of business administration at Texas A. and M. College, effective September, 1959.

Lloyd Saville is on leave during the academic year 1959–60 from the Department of Economics and Business Administration, Duke University, to do research work in Italy. He has been awarded a Fulbright Grant and a Guggenheim Foundation Fellowship.

Frederick W. Schaeberle has been appointed to the accounting staff at Rollins College.

Thomas M. Schiewetz, manager of the midwest division of the Standard Register Company, has been named a lecturer in industrial management at the College of Business Administration, University of Arkansas.

Elliott Schwartz has been appointed part-time instructor in accounting in the School of Business Administration, University of North Carolina.

William Seale has resigned as instructor in the Department of Business Administration at the College of William and Mary in Norfolk to complete his doctoral program at the University of North Carolina.

E. L. Shaner has been appointed instructor in management and marketing at Louisiana State University.

Stephen P. Shao has been promoted to professor in business administration at the College of William and Mary in Norfolk.

Karl W. Sharp has joined the staff in Business Administration at East Tennessee State College.

Allen M. Sievers, professor of economics, University of Florida, served as visiting lecturer, College of the City of New York, during the summer, 1959.

Samuel A. Silver, formerly assistant professor of business law at North Texas State College, has been appointed to the faculty of the Texas College of Arts and Industries, effective September, 1959.

Andre Simmons has returned to the University of Florida as instructor of economics after completing his work for the doctorate at the London School of Economics.

Jerry P. Simpson has been appointed assistant professor of economics at Louisiana State University in New Orleans. He was formerly at Texas Christian College.

H. K. Snell, on leave as a transportation expert and advisor to the United Nations in Egypt, returned to his position as professor of transportation at the University of Texas in September, 1959.

Eldred Speck has accepted a position as assistant professor in the Department of Business Administration at McNeese State College.

John H. D. Spencer, formerly at Mississippi State University, has been appointed associate professor of economics at the College of Business Administration, University of Georgia.

George A. Spiva, assistant professor of economics at the University of Tennessee, is on leave for two years under a Ford Foundation Fellowship lecturing in Indonesia.

Robert M. St. Clair has resigned from the College of William and Mary in Norfolk to accept a position as associate professor in the Department of Business Administration at Fairleigh Dickinson University.

Finis St. John, III, has been added to the staff of the Department of Business Administration, St. Bernard College.

W. E. Swyers has been appointed instructor in accounting at Louisiana State University.

John R. Tabb, head of the Division of Economics and Business Administration at the College of William and Mary in Norfolk, has been appointed economic advisor to the Tidewater Virginia Development Council and the Southeastern Regional Planning Commission.

Lloyd H. Taylor, of the University of Arkansas, has been appointed assistant professor of business administration at Texas A. and M. College, effective September, 1959.

Margaret Teague, instructor in business education at Harding College, has left to do graduate work at Columbia University.

Albert Teich, Jr. has been promoted to associate professor in business and labor law at the College of William and Mary in Norfolk.

Vernon L. Terrell, who received the M.B.A. degree at the University of Mississippi in May, has been appointed instructor of economics at the same institution.

William A. Terrill has been promoted to professor of accounting in the School of Business Administration, University of North Carolina.

Charles C. Thigpen, assistant professor of statistics at the University of Tennessee, is on leave under a Ford Foundation Fellowship at Virginia Polytechnic Institute working toward the Ph.D. degree.

Herman P. Thomas, who has been serving as acting dean of the School of Business Administration of the University of Richmond, returned to his duties as professor and chairman of the Department of Economics as of July 1, 1959.

William J. Thomas, formerly professor of economics and statistics and director of the Bureau of Business and Economic Research at Baylor University, has been appointed finance examiner with the Texas Commission on Higher Education.

J. N. Thornhill has been appointed instructor in economics at Louisiana State University.

Warren Thrailkill, who has been engaged in public accounting, has been appointed head of the Department of Business Administration at St. Bernard College.

Guy W. Trump, formerly dean at the United States Merchant Marine Academy, has been appointed dean of the School of Business Administration, Emory University, effective September 1, 1959.

Marvin Tummins has been promoted to professor of commerce in the McIntire School of Commerce of the University of Virginia.

Frank W. Tuttle, associate professor of economics, University of Florida, served as visiting professor at Portland State University during the summer, 1959.

Paul M. Umberger has been appointed instructor in the School of Business of Richmond Professional Institute (Virginia).

James C. Vadakin, professor of economics, University of Miami, spent six weeks with the Atlantic Refining Company during the summer of 1959 under a fellowship granted by the Foundation for Economic Education.

Frank T. de Vyver, chairman of the Department of Economics and Business Administration, Duke University, was in South Africa doing research during the months of June, July and August, 1959.

Murray Watson, of Baylor University, has been appointed instructor in business law in the Hankamer School of Business, Baylor University, effective September, 1959.

Martin P. Wehling is on leave of absence from Mississippi Southern College to do graduate work at the University of Alabama.

John D. Wells, formerly of the University of Texas, has been appointed assistant professor of economics and statistics, University of Florida.

Bryon White, of the University of Texas, has been appointed associate professor of economics at Appalachian State Teachers College.

Jean I. White has been appointed instructor in the School of Business of Richmond Professional Institute (Virginia).

James R. Whitney has been appointed part-time instructor in accounting in the School of Business Administration, University of North Carolina.

Frank Williams, associate professor of statistics at the University of Tennessee, has resigned and is teaching at San Francisco State College.

Franklin S. Williams, formerly chairman of the Department of Pharmacy Administration in the

University of Arkansas School of Pharmacy, has been appointed professor of marketing, College of Business Administration, University of Arkansas.

John T. Williams has joined the staff in Business Administration at Morristown College (Tennessee).

Ned Williams, assistant professor of economics at the University of Mississippi, has been granted sabbatical leave to continue graduate work at Columbia University.

Sam M. Willis, assistant professor of industrial management, Clemson College, is on leave attending the University of Alabama.

Henry B. Wilson has resigned as associate professor of business administration at Mississippi Southern College.

Norman Jewel Wood has been promoted to associate professor of business administration at the College of Business Administration, University of Georgia.

Leslie Wright, of the University of Edinburgh, has received a Whitney-Fulbright award and is serving as lecturer in economics at the Rice Institute during the fall semester of 1959.

Leland B. Yeager has been promoted to associate professor of economics at the University of Virginia.

Percy B. Yeargan has been promoted to associate professor of accounting in the School of Commerce and Business Administration, University of Alabama.

NEW MEMBERS

The following names have been added to the membership of the Southern Economic Association:

James B. Apalding, Jr., 118 Miller Avenue, Maryville, Tenn.
E. V. Bowden, College of William and Mary in Norfolk, Norfolk, Va.
Editha M. Brannock, 1713 Dallas Street, Raleigh, N. C.
Luther M. Cole, Jr., P. O. Box 1645, University, Ala.
Dan D. Davis, Box 1926, University, Ala.
John A. Davis, Mississippi State University, State College, Miss.
Arthur T. Dietz, Emory University, Atlanta, Ga.
M. A. Eakins, Georgia State College for Women, Milledgeville, Ga.
Richard T. Eastwood, 2623 South Lane, Birmingham, Ala.
Edgar O. Edwards, Rice Institute, Houston, Tex.
Charles F. Floyd, Hillsboro, N. C.
Charles S. Franklin, 10 Maplehurst Park, Knoxville, Tenn.
Catherine Glenn, U. S. Department of Labor, Atlanta, Ga.
Joseph A. Greene, Jr., Mississippi Southern College, Hattiesburg, Miss.
H. Gordon Hayes, 628 Stratford Drive, New Orleans, La.
Raymond W. Heatwole, 210 McPherson Lane, Greenville, S. C.
P. T. Hendershot, Louisiana Polytechnic Institute, Ruston, La.
Everette N. Hong, University of Southern Illinois, Carbondale, Ill.
Jarrett Hudnall, Jr., P. O. Box 3444, University, Ala.
Elsie C. Jones, 545 N. E. 10th Avenue, Gainesville, Fla.
Bryce D. Jordan, Box 4863, University, Ala.
Edith Nell Lea, U. S. Department of Labor, Atlanta, Ga.
Harold C. Love, University of Houston, Houston, Tex.
F. Ray Marshall, Louisiana State University, Baton Rouge, La.
D. Gray Miley, Mississippi College, Clinton, Miss.
John E. Moes, University of Virginia, Charlottesville, Va.
John R. Moore, University of Tennessee, Knoxville, Tenn.
James Parthemos, Tulane University, New Orleans, La.
Marion C. Phillips, University of Oklahoma, Norman, Okla.
Grady R. Poole, 3933 6th Street East, Tuscaloosa, Ala.
Leo J. Raskind, Vanderbilt University, Nashville, Tenn.
W. Clyde Robinson, Baylor University, Waco, Tex.
Robert V. Roosa, Federal Reserve Bank of New York, New York, N. Y.
Elmo Schwab, Jr., Box 236, Gonzales, Tex.
James Sideris, 1420 East Lee Street, Pensacola, Fla.
Bernard F. Sliger, Louisiana State University, Baton Rouge, La.
Alfred G. Smith, Jr., University of South Carolina, Columbia, S. C.
Jay A. Smith, Jr., University of Tennessee, Knoxville, Tenn.
S. E. Trotter, Mississippi State University, State College, Miss.
Paul L. Tuttrup, Long Branch Road, Cullowhee, N. C.
James M. Waller, University of Georgia, Athens, Ga.
Richard P. Wilson, 202½ North Husband, Stillwater, Okla.
Fred Yoder, Campbellsville College, Campbellsville, Ky.

AWARDS BY INTER-UNIVERSITY COMMITTEE FOR ECONOMIC RESEARCH ON THE SOUTH

In May, 1959, the Inter-University Committee for Economic Research on the South awarded re-

search grants and graduate fellowships for the summer of 1959 and the academic year 1959–60.

The eleven people who received research grants were: Avery B. Cohan, University of North Carolina; G. T. Dowdy, Tuskegee Institute; Werner Hochwald, Washington University; Roy L. Lassiter, Jr., University of Florida; George Macesich, Florida State University; John E. Moes, University of Virginia; William N. Parker, University of North Carolina; Alex A. Rosental, Saint Louis University; Howard G. Schaller, Tulane University; H. Ellsworth Steele, Alabama Polytechnic Institute; and Ernst W. Swanson, Georgia Institute of Technology.

The four recipients of graduate fellowships were: Paul F. Huddleston, University of Alabama; Marvin Lee, University of North Carolina; James M. McQuiston, Jr., University of Virginia; and Mrs. Franklee Whartenby, University of North Carolina.

The membership of the Committee and information about grants and fellowships for the summer of 1960 and the academic year 1960–61 are given elsewhere in this *Journal*.

ERRATUM

In the last line of footnote 44 at the bottom of page 406 of Joseph J. Spengler's article, "Adam Smith's Theory of Economic Growth," in the April 1959 issue of this *Journal*, the words should be "some non-Austrians," not "the Austrians." The latter stressed the non-permanence of capital goods, as Hayek shows in the work cited.

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The Ford Foundation has made available to the Inter-University Committee for Economic Research on the South a grant of $50,000 per year for five years to support studies on the economic development of the South. A major part of the funds will be allocated as: (1) *research grants* to mature research workers; and (2) *fellowships* to qualified graduate students in the social sciences. Interested parties are invited to apply for funds in accordance with the conditions set forth on the following pages. Recipients of research grants will be recognized as Research Fellows of the Inter-University Committee for Economic Research on the South. Recipients of graduate fellowships will be recognized as Graduate Fellows of the Committee.

The members of the Inter-University Committee for Economic Research on the South are:

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Eligible Applicants: Application may be made by any person of demonstrated research ability in the field of the proposed project or by any person who, because of his training and/or performance, shows definite promise of superior research ability in the field in which he proposes to work.

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